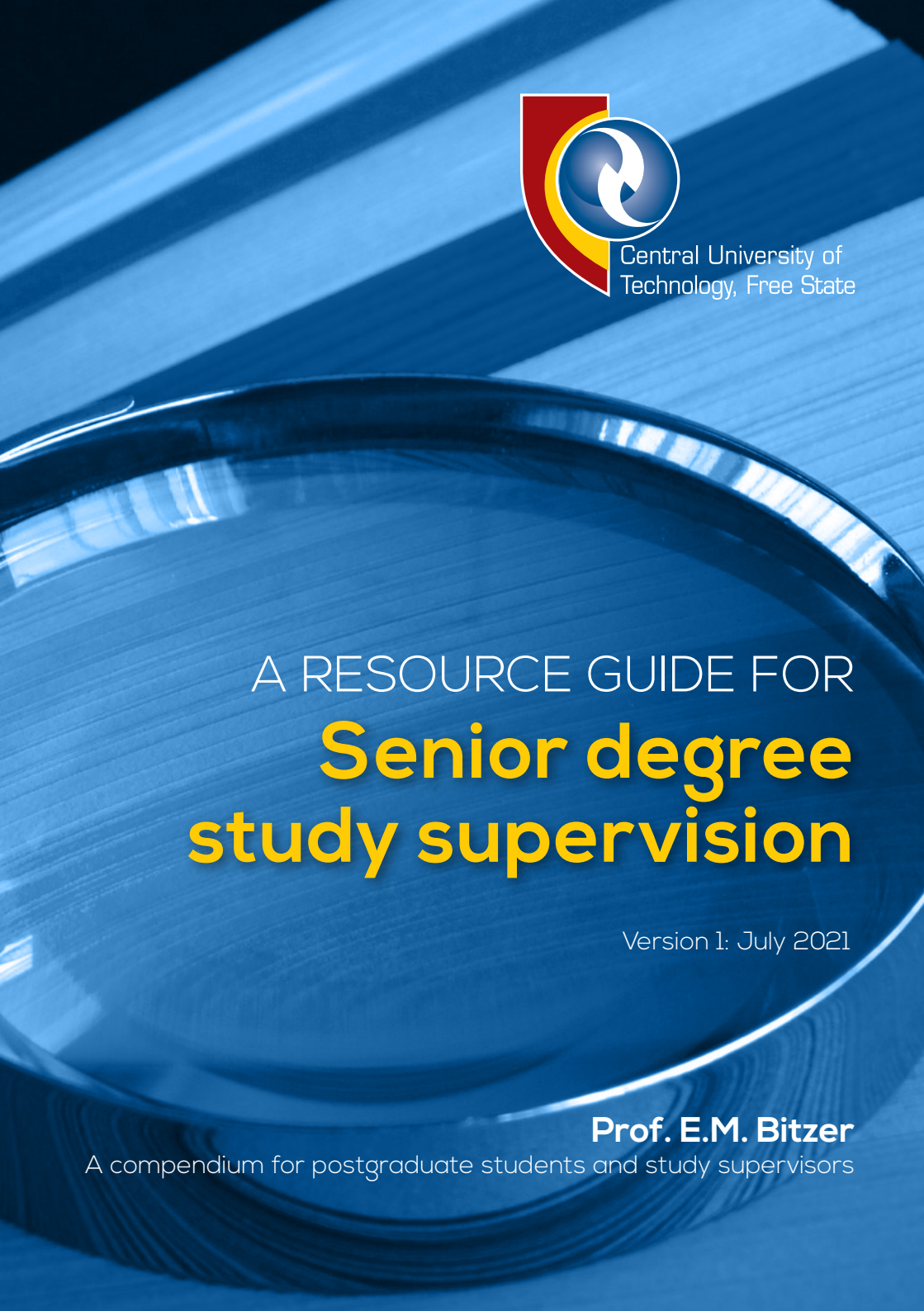

Central University of Technology, Free State

A RESOURCE GUIDE FOR

Senior degree study supervision

Version 1: July 2021

Prof. E.M. Bitzer

A compendium for postgraduate students and study supervisors

A RESOURCE GUIDE FOR

Senior degree study supervision

Compiled by:

Prof. E.M. Bitzer

Centre for Higher and Adult Education
Stellenbosch University.
Version 1: July 2021

This compendium involves a collection of concise, but relatively detailed, information about concepts, procedures and ideas that could be of value to research students and their supervisors.

A Resource Guide for Senior Degree Study Supervision

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BACKGROUND

South Africa, like the rest of the world, is constantly facing new developments and challenges. Like other sectors of society, higher education is affected by these developments and challenges in many ways. Examples are: The Corona pandemic, student health issues, institutional health and safety measures, data and hardware constraints, limited physical access to universities, financial challenges, educational delays, inequality issues, and more. Similarly, senior degree research at universities poses new questions and challenges with factors such as limited face-to-face contact between research students and their supervisors, difficulties with laboratory and field work, limited or no access to research sites and participants, new 'normal' modes of remote communication, limited access to data and student services, and the 2020 national review of the doctorate and its future implications.

Against this background, questions are increasingly asked about alternative ways of supervising senior degree research. For instance, the traditional 'apprenticeship' model of supervision seems to be increasingly challenged in terms of its efficiency and effectiveness; how ever-increasing larger numbers of postgraduate students are to be handled; How to increase the limited supervisory capacity of institutions; the demand for increased research output; the quality of student research, and the relevance or usefulness of senior degree research products.

The author has been involved with the training and development of senior degree study supervisors at the Central University of Technology since 2017. Workshops and other events were facilitated for the past number of years to support research supervisors and students at CUT to acquire relevant knowledge and skills to guide master's and doctoral students towards study success.

THE GUIDE

This generic supervision resource guide (SRG) supplements a series of at least four webinars that were held in the first and second semesters of 2021 and continued into 2022. All activities involved senior degree supervisors who are early career researchers relatively new to the task of supervising and involved brief notes and information via four modules, each addressing several issues of supervisory concern. The SRG does not address any discipline or field-specific issues, which is the concern of individual faculties, departments and research units.

The four modules, comprising 13 relevant generic topics, are:

(1) The 'bigger picture' of research supervision;

(2) Some supervision practices;

(3) Assessing senior degree work; and

(4) 'Other' important tasks of study supervisors.

The SRG is accompanied by a list of potentially useful references to books, articles and websites. It serves as a basic resource, accompanied by a series of four webinars.

MODULE 1

The 'bigger picture' of supervision

(Webinar 1)

Topic 1.1: Supervision within context

In Module 1 several important questions related to senior degree supervision were addressed. These included:

- What are the national and international trends that dominate research and practices regarding senior degree supervision?
- What roles, styles, modes and models of supervision can study supervisors readily adopt?
- What opportunities and challenges are presented by co-supervision?
- What are the ultimate goals of master's and doctoral studies and their supervision?
- Why has the doctorate by publication and its supervision become increasingly popular lately?

Questions such as these have been asked by supervisors across countries, universities in general and at CUT in particular. To supplement the discussions that emerged from Webinar 1, a few notes on each of these questions follow below.

Trends in senior degree study supervision

Firstly, what has become clear during the past number of years is that the 'traditional' supervisory model of 'the apprenticeship' (i. e. where one supervisor guides one student) has been questioned because of economic and academic factors. Economic, because one-on-one supervision is rather expensive and with the numbers of senior degree students on the increase this model is probably not financially sustainable. Academically it is also questioned whether one supervisor has all the knowledge and skills to properly supervise several studies; particularly since multi- and cross-disciplinary research has become more popular and is much needed to solve today's complex problems. Topic 2 will elaborate further on this issue.

Secondly, during 2020 the Covid-19 pandemic caused much havoc in countries, societies and institutions. Senior degree research was not

spared, and Covid risks involved limited or no face-to-face contact between supervisors and students. Health regulatory measures were accompanied by restrictions to research sites and research populations, resulting in many challenges to students' research plans. In many cases these restrictions caused the postponement or even suspension of research projects. Research constraints were also ameliorated by budgetary and financial revisions, causing anxiety and uncertainty among students and supervisors. International research co-operation was also compromised in many fields of study across the globe. In a country such as Australia, for instance, it is estimated that more than 21 000 academic jobs and 23 billion Australian dollars were lost due to a ban on foreign students to study at Australian universities (University World News, 22 April 2020). South Africa experienced similar problems regarding foreign students and research, but not at the scale of countries such as the UK, Australia, the USA and others.

Thirdly, it has become increasingly difficult to conduct on-site research in industries, businesses, workplaces and governmental institutions due to access restrictions. Ethical clearance protocols were compromised, and ethics applications had to be resubmitted in view of new research plans. Such new requirements caused delays in research completions to the frustration of senior degree students and their study supervisors. On the positive side, however, research students were allowed increased flexibility in their research decisions and online support in the form of webinars, workshops and consultations provided some relief. Research students also, in many instances under the guidance of supervisors, formed virtual study groups and circles to support one another and kerb the problem of 'study loneliness'. In addition, university libraries and other services went to great lengths in efforts to meet students' information and other needs. This includes the services of university graduate schools and graduate offices.

Fourthly, and mainly caused by the Covid-19 pandemic, both students and supervisors experienced health issues. Such issues were not always detected in time and where they were detected, contributed to study delays or cases where supervisors had to be temporarily

or permanently replaced. In several known cases, supervisors and students lost their lives, which had major impacts on the completion of research programmes, the mental health of fellow researchers, academic colleagues and students. One upside of a greater reliance on remote, distance and virtual supervision was that supervisors and students started to experiment with different forms of communication and utilised alternative platforms to facilitate research planning and discussions. As a result, the frequency of supervisory meetings and activities could be better paced and managed, and the progress of research students better monitored.

Lastly, the doctorate as a qualification went under the spotlight in 2020/21 due to the national review of doctoral degrees at all South African universities. Institutions had to prepare self-evaluation reports which were discussed during virtual site visits which have led to recommendations for improvement. Several positives were found to be in place at CUT, but there were also areas identified that need further work and improvement in the years to come. One such area is the articulation and incorporation of senior degree attributes in doctoral programmes. This issue will be highlighted in Topic 1.4.

These are some trends that emerged from the 'new normal' that all universities have experienced in 2020/21, and while some may be addressed in 2021, many will probably continue to be addressed.

We turn now to Topic 1.2, looking at models of supervision.

Topic 1.2: Supervision models

This topic focuses on the pertinent issue of roles, styles, modes and models of supervision. It also addresses the characteristics, advantages and disadvantages of different models of supervision and touches on some issues related to supervising students over distance or 'remote' supervision.

(a) Roles, models and styles of supervision

Important elements of senior degree supervision include the issue of *supervisor roles* (the various supervisory positions a supervisor can adopt and the tasks a supervisor must accomplish), *supervisor styles or approaches* (the ways in which supervisors interact and communicate with students to guide their studies) and *models of supervision* (the chosen structure of supervision, whether dyadic, project based, group-based; team-based, at a distance).

In judging one's own supervision practices it seems important to determine a 'current' and an 'ideal' position (see Table 1 below). For instance, an individual supervisor supervising an individual student might be an ideal situation; this is if the numbers of senior degree students are low and individual attention is possible. However, if research student numbers and departmental expectations about completion rates increase, individual supervision might be a less ideal model to follow. Also, if a supervisor lacks a particular knowledge base or set of skills (e. g. regarding research methodology or supervisory experience), one-to-one supervision might also not be ideal. Because of these mitigating factors, the trend internationally is towards teams of supervisors that supervise cohorts of students. The implications of these trends are discussed below.

TABLE 1: Positioning supervisor practices

	Individual student	Students in teams/ cohorts
Individual supervisor	✓	✓
Co-supervisors	✓	✓
Supervisory teams	✓	✓

What Table 1 shows is that supervisors can position themselves in various ways regarding supervision practices. They can choose to supervise one student per project or to supervise a cohort or a group of students per larger research theme or project. They can also supervise with or without co-supervisors, depending on the demands of any specific study or any group of related studies. Alternatively, supervisors can be part of a supervisory team (as a main or co-supervisor) that supervise individual students or groups of students. Such supervisory choices largely depend on the resources, decisions and limitations of respective departments, faculties and institutions.

Also important are a few important concepts related to senior degree supervision roles (see Table 2 below).

TABLE 2: A framework for concepts of research supervision roles (Lee, 2020)

	Supervisor's activity	Supervisor's knowledge and skills	Possible student reaction
Functional	Rational progression through tasks	Directing, project management	Obedience, organised
Enculturation	Gatekeeping	Diagnosis of deficiencies, coaching	Role modelling
Critical thinking	Evaluation, challenge	Argument, analysis	Constant inquiry, fight or flight
Emancipation	Mentoring, supporting, constructivism	Facilitation, reflection	Personal growth, reframing
Relationship development	Supervising by experience, developing a relationship	Emotional intelligence	Growth in social skills and emotional intelligence

Table 2 shows, in the top horizontal bar, the different aims of supervision. Varying, for instance, from supervisors playing a functional role (far left) to playing and emancipatory role (far right). The left-hand, vertical column indicates possible activities, knowledge and skills positions adopted by supervisors and possible student responses to such positions. For instance, if a supervisor sees his/her supervision solely as a rational project closely directed by her/himself, the student might react by being extremely obedient and organised (as in the second column, last line of Table 2). However, if a supervisor takes on a more emancipatory role as research mentor and facilitator promoting continuous reflection with students (see the second last column, last line of Table 2), students might respond with personal growth and increased research competence as the study progresses. In the case of doctoral students, for instance, the aim for them is to become independent researchers. This might not happen unless a supervisor shifts his/her position during a study from being directive to being emancipatory and from keeping the student dependent as researcher to allowing the student to become an independent researcher who can initiate own research.

Literature and observed practices point to a few supervision models. These models should not be seen in isolation but are mostly considered as being 'blended' or 'integrated'.

- The apprentice-master model;
- Team supervision/co-supervision-model;
- The collaborative cohort-model;
- 'Distance' or 'remote' supervision; and
- 'Mixed' mode options.

(b) Modes/models of supervision - characteristics and implications

Apprentice-master supervision

(in many instances this is the 'default' model at institutions)

This model prevails where an established 'master' supervisor inducts the new 'apprentice' student into the 'mysteries of the craft of research'. Research apprentices thus mainly learn by observing how supervisors conduct their research, undertaking sustained research themselves and from written and verbal feedback on submitted work.

Assumptions include that supervisors are the learned experts and that students are novice researchers who learn by observation and doing whereas the supervisor engages in roles such as mentoring, sponsoring, promoting and coaching. It is also assumed that students are well selected, intelligent, mostly self-motivated and -directed; capable of becoming independent researchers with minimal input from supervisors. This model of supervision can sometimes lead to the isolation of students and/or uneven positions of power.

Team supervision

Increases in the use of supervisory teams in part reflects a growing trend towards inter-disciplinarity and the recognition that a single supervisor is unlikely to have the full range of knowledge and skills to support complex research work (e. g. methodological skills, subject knowledge). What is often the case is that teams of supervisors are probably more common in the natural sciences than in social sciences, and that the team model of supervision might be more challenging for senior degree students to handle as team dynamic may not be always cohesive or harmonious.

However, team supervision is thought to reduce the risk of supervisory incompetence, increasing the likelihood of successful completion. When the team consists of one experienced supervisor teaming up with a novice supervisor this could be understood as a supervisory 'coaching' or 'mentoring'. Such an arrangement gives rise to status

differentiation within the team, but due to clear role definition will potentially result in more harmonious and smoother functioning than where supervisors have equal status.

In team supervision, relationships among supervisors can both positively and negatively affect student's experience of research. Teams characterised by intellectual and personal divisions can result in students being 'caught up in the middle'. Therefore, communication is at the core of effective team supervision. For instance, pre-meeting communication between supervisors on submitted work is essential to iron out differences of opinion and ensure an agreed 'line' of feedback to the student – this builds trust in the supervision relationship and avoids conflicting messages. However, disagreements between supervisors can provide opportunity for deeper critical reflection on both ideas and process and benefit the student – the key is the way in which differences are shared and managed. Effective supervisory teams represent intellectually and practically engaged cooperatives operating in the best interest of the student and safeguards continuity in case of illness, death or departure of one of the supervisors.

Cohort supervision

All students who enroll for their senior degrees (or who have completed their coursework) within a discipline/project/department in a particular year compose a collaborative learning cohort. One or more faculty member(s) serves as coordinator and mentor (this could also be a supervisor) to promote the guidance of students into a research culture. The cohort meets regularly, either in person, or by electronic means (Skype/Zoom/MS Teams), thus promoting a community of practice/research. Students present their work from time to time to cohort members, who provide feedback to promote constructive criticism. During meetings students might discuss a range of issues related to their studies (e. g. research methodology, appropriate and useful literature, technology), but they can also form smaller 'buddy' groups within the larger cohort.

The roles of the coordinating faculty member in cohort supervision include the following: To organise and structure meetings; to facilitate

the meeting according to an agenda; to establish communication mechanisms for cohort members; to teach constructive feedback skills to students, and to structure links between students with appropriate experts. If the coordinating faculty member is not the supervisor, students must inform their supervisor(s) of participating in the cohort and the supervisor should receive regular communication from cohort meetings.

There are both advantages and disadvantages to the supervision of students in cohorts (see Table 3).

TABLE 3: Advantages and disadvantages of senior degree supervision in cohorts

✓ ADVANTAGES	✗ DISADVANTAGES
Students feel less isolated, because of opportunities to meet with fellow students in a collaborative fashion to discuss common issues and concerns.	Careful selection of the coordinating faculty member is crucial – increase in faculty workload could have ripple effect.
Students are more likely to complete their theses and dissertations.	There is the potential of conflict between the coordinating faculty member and individual supervisors.
Students gain a greater breadth of knowledge from reading fellow students' work.	Some students might not thrive under or benefit from cohorts and may prefer to work alone.
Students acquire knowledge and understanding of a wider range of research design and methods.	
Students acquire critical feedback skills.	
Workload for supervisors could decrease.	
The quality of study proposals and research products produced by students is enhanced.	

The figure below indicates how the supervision of student cohorts could be organised and aligned within a department or faculty, starting with basic undergraduate projects and scaffolding up towards a project team within a field of specialisation over a time period.

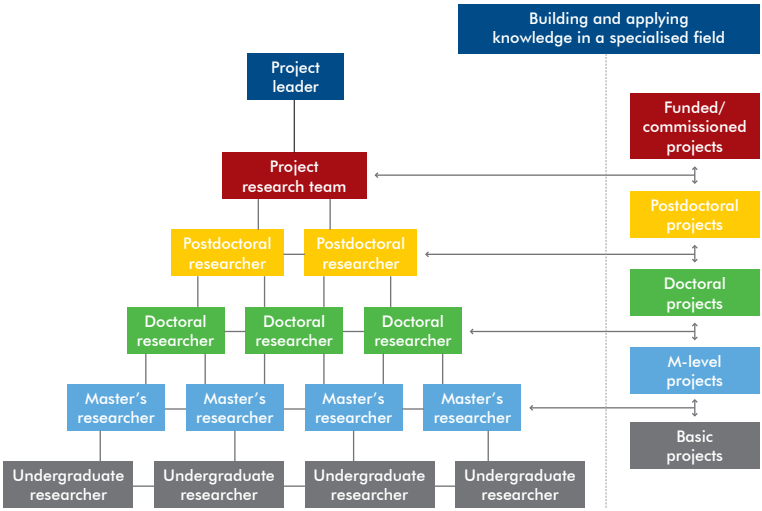


Figure 1: Cohort supervision showing the scaffolding of projects and research roles at different levels.

'Remote' supervision

Much research supervision in the past might occurred as 'remote' supervision. For instance, senior degree students were registering as international students for many years. In more recent times, also resulting from the Covid-19 situation, this option involves a mixture of all the former alternative models by incorporating new technologies. Remote supervision combines individual sessions between supervisors and students with virtual meeting options involving teleconferencing, the use of online platforms and exemplars, discussion groups and self-paced (online) research training which create virtual communities of practice.

Supervision at a distance needs a structured approach, the formation of student communities of practice, and regular feedback and communication (Jacobs, 2020). Specific supervisory skills are needed in online communication, the use of asynchronous and synchronous technologies, the management of online communication and social skills (Kumar & Johnson, 2017). It also involves academic, professional and psychosocial support.

At the institutional level, resources and support for research (e. g. access to research software online) should be available to students so that individual supervisors do not have to find and communicate such resources but can focus on the online mentoring of the research itself (Kumar & Johnson, 2017). The importance of structure, small group mentoring and peer support in overcoming challenges faced during online supervision (Kumar & Johnson, 2017) cannot be over-emphasised.

Supervision at a distance requires online student accountability, peer support and institutional support (Kumar & Coe, 2019). If a supervisor is inexperienced or underqualified, not a permanent staff member or in cases of inter-disciplinary or multi-disciplinary research, team/co-supervision is preferable (University College Cork, 2018). Some of these issues and many others are recorded in a recent useful resource: see Kumar, S., Kumar, V. & Taylor, S. (2020) A Guide to Online Supervision. UK Council for Graduate Education.

In summary

Table 4 below provides a summary of the supervision models touched upon in terms of their distinctive characteristics.

TABLE 4: Supervision models and some characteristics

MODELS	SOME CHARACTERISTICS
Apprenticeship model (one-to-one)	▪ The issue of power and possible misuse. ▪ The possibility of student isolation. ▪ Limited numbers of students can be accommodated and the time efficiency of the model. ▪ Can involve mentoring and coaching, roles that are effective but may consume much additional time from supervisors.
Supervisory Team model (a team of two or more supervisors)	▪ The benefit of the 'experience mix' of the supervisory team. ▪ More supervisor flexibility as more supervisors are involved. ▪ Delegation of supervisory tasks and inexperienced staff are acquiring supervisory skills. ▪ Study management responsibilities are distributed.
Student cohort model (a group of students from the same year of enrolments or programme)	▪ Increased peer interaction promotes quality ▪ Students experience a sense of 'community of practice'. ▪ Students are more easily encultured into doctoral identity formation. ▪ There is a more distributed sense of power in this model.
'Remote' model (where supervision is exclusively provided on-line or at a distance)	▪ Variation in supervisory roles and responsibilities, the use of information technology and adhering to inclusion principles. ▪ The model also demands new supervisory planning and delivery platforms and frameworks.

(Based on multiple sources in the Reference List)

Notwithstanding the supervisory model chosen, the importance of trust between supervisors and students needs to be emphasised. Trust is central to knowledge development, the development towards independent scholarship and the promotion of safe spaces for research students to try out their ideas, to support meaning making and to promote knowledge formation. Developing trust takes time and effort and is accompanied by effective communication. This includes clarifying roles and responsibilities, expectations, setting and adhering to timelines, logistics, and responsiveness to the work patterns of those involved in the relationship. Supervisors are expected to promote their students' interests, although not at the expense of their own, and thus reciprocity as well as boundaries are needed.

Finally:

- Note that the chosen model or hybrid model of supervision (apprenticeship, team, group, remote) largely determines the roles and responsibilities of supervisors.
- The type of study (disciplinary, inter-disciplinary, trans-disciplinary, multi-disciplinary) is also a major factor in determining and refining supervisory roles.
- The level of studies (master's or doctorate) plays a part in demonstrating supervisory roles and styles.
- Conventions of disciplines / universities / faculties / schools / departments might be an important determinant (but also: How do we break out of these molds?).
- The personality and supervision/communication style of a supervisor are important variables in study supervision and not all academics do supervise successfully, just as not all senior degree students successfully conduct research (note: a supervisor is literally 'an overseer' of the study/research process).

- Note that research supervision typically revolves around two main dimensions, namely (A) Structure and (B) Support. Gatfield (2005, as in Lee, 2020) has identified four potential supervisory styles related to these two dimensions as '*Pastoral*' (high in support, low in structure), '*Interventional*' (high in support and high in structure), '*Laissez-faire*' (low in structure and low in support), and '*Directorial*' (high in structure, low in support). Literature suggests that if there is congruence between supervisory styles, and the associated assumptions about the needs of candidates and their actual needs, there should be no difficulties in successfully employing a particular style.

Topic 1.3: Supervisory roles, responsibilities and agreements

Supervisory roles and responsibilities

Trust, supported by timeous and clear communication provide the cement that holds most successful senior degree study projects together. In particular:

- Trust between student(s) and supervisors(s) needs to be established early in the supervisor-student relationship. Trust is earned, does not happen automatically and takes time to build.
- Clear expectations and appropriate protocols promote sound supervisor-student relationships. At CUT, a protocol agreement between students and supervisors is mandatory.
- The aims of senior degree supervision are to cultivate research expertise and ultimately promote independent research scholarship.
- Good supervisors provide safe spaces for student researchers to try out their ideas and support them in making meaning of their findings; research education is first and foremost providing a learning experience.

- Good supervisors acknowledge reciprocity of commitment and set clear boundaries for the study process and the study relationship.

During supervising a senior degree study, different supervisory roles include the following (also see Lee, 2020):

- being an *expert and a guide* for different elements of a study;
- being a *quality controller*, both for the research process and the final product of a study;
- (sometimes) being a *pastor/counsellor,* showing interest and sensitivity to students who experience academic and other challenges during a study;
- being a *study manager* who is resource sensitive and helping students to effectively pace the study process; and
- being an *emancipator* by assisting students to move from research dependence to research independence (particularly at PhD level).

Supervisory tasks that accompany these different roles include:

- Recruiting and selecting senior degree students;
- Guiding research proposals;
- Guiding ethical clearance arrangements and applications;
- Assisting with research funding applications;
- Providing infrastructural/laboratory/research space;
- Scheduling and conducting study meetings;
- Facilitating research training for students and promoting research networking;
- Providing timeous and effective feedback on students' work; and
- Recruiting appropriate and trustworthy examiners for students' studies.

In turn, senior degree students need to take responsibility for items such as:

- Clarifying their supervisors' expectations;
- Establishing and maintaining productive study (student-supervisor) relationships;
- Establishing and maintaining peer research relationships;
- Making the best use of consultation/contract/communication/ guidance opportunities;
- Self-managing and pacing the research process (wherein personal time management is crucial);
- Continuously engaging in their studies (not sporadic) and committing themselves to scholarly growth;
- Finding and exploring literature and methodological options; and
- Adhering to ethical, legal and financial requirements during their studies.

Co-supervision

The issue of co-supervision needs a special mention. Where two or more study supervisors are guiding research, clarity is needed about the role of each supervisor and how such roles will be operational during a particular study. Taylor, Kiley & Humphrey (2017) devote a whole chapter to co-supervision and the questions they address include the following:

- Milestones: Who is responsible for ensuring that the student achieves his/her study milestones?
- Adhering to policies: Whose responsibility is it to ensure that the student knows and follows policies related to research ethics, plagiarism, and other important study issues?

- Meetings: How often will study meetings take place, who will organise such meetings and will they include all team members or only some? Who will keep track of the decisions taken at study meetings?
- Publishing: What are the expectations regarding publishing during or from a study? Who will claim which share of the publication?
- Communication: What is the process for raising and discussing concerns about/with the candidate or about one another? What if the student goes to one of the supervisors with a problem pertaining to the other supervisor?
- Research strengths: What strengths do each supervisor bring to the supervisory team?
- Personal skills: What personal strengths do each bring to the team?
- Conflict: What happens if one (or more) of the supervisors does not contribute or neglects his/her work?
- Training and development of capacity: Is there a role for at least one of the supervisors in mentoring less experienced supervisors? (For other possible issues to be clarified regarding co-supervision within a South African context, see: *http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0038-23532015000600023*)

Topic 1.4: Differences between master's and doctoral supervision, including supervising the doctorate by publication

At CUT ten general graduate attributes are required from programmes and students at study exit. These general graduate attributes that apply to all CUT graduates are (see the CUT policy document on Graduate Attributes):

- Sensitivity towards sustainable development; engaging in/with communities; practicing entrepreneurship; committing to innovation and problem solving; being technologically

literate; being numerate; practising effective communication; demonstrating technical and conceptual competence; be effective in teamwork; and adhering to national and global citizenship.

At the senior degree level graduates need to demonstrate, at the minimum, an ability to:

- develop some level of research expertise and critical judgement of knowledge;
- interpret scholarly debates and literature;
- identify and effectively apply research methodology;
- apply knowledge to solve identified problems;
- carry out ethically responsible research;
- make independent research judgements;
- appropriately produce and defend scholarly work;
- effect change for the better through their research;
- effectively manage or co-manage a research project;
- operate relatively independently and take responsibility for own work;
- make a meaningful and positive contribution to society; and
- demonstrate ethical and visionary leadership within different contexts.

Qualification differences

The differences between qualification level outcomes have been documented as 'level descriptors' and published by the South African Qualifications Authority (SAQA) as early as 2012: *https://www.saqa.org.za/sites/default/files/2019-11/level_descriptors.pdf)*

As it is not possible to discuss all the qualification characteristics of Level 9 and 10 qualifications in detail here, only one major issue needs to be highlighted. The HEQSF states that, at the master's level:

A Master's graduate must be able to deal with complex issues both systematically and creatively, make sound judgments using data and information at their disposal and communicate their conclusions clearly to specialist and non-specialist audiences. Demonstrate self-direction and originality in tackling and solving problems, act autonomously in planning and implementing tasks at a professional or equivalent and continue to advance their knowledge, understanding and skills.

At the doctoral level, however, the requirements are quite different:

The defining characteristic of this qualification is that the candidate is required to demonstrate a high-level research capability and make a significant and original academic contribution at the frontiers of a discipline or field. The work must be of a high quality to satisfy peer review and merit publication. The degree may be earned through pure discipline-based or multidisciplinary research or applied research. This degree requires a minimum of two year's full-time study, usually after completing a master's degree. A graduate must be able to supervise and evaluate the research of others in the area of specialisation concerned.

The main difference between a master's and a doctoral degree is thus that, at the master's level, the focus is clearly on research methodology whereby students need to learn how to select and use such methodology intelligently and appropriately. At the level of the doctorate, however, knowledge and skills pertaining to methodology are assumed to be in place. The focus in the doctorate is thus on *how* and *what* the research contributes to the relevant field or to solving identified problems. This does not mean that students at the master's

level cannot or do not contribute to new knowledge or problem-solving (in some fields such as engineering, health sciences and others they do), but this basic distinction is internationally acknowledged.

Also important is the difference in focus of the PhD (Doctor of Philosophy) and the Professional Doctorate (such as the DBA, DEng, DCom, DEd, DArch, DPharm and others). In the PhD, the focus is on preparing (mainly) for an academic career and educating professional researchers who can demonstrate high levels of research capability and making significant original contributions to a discipline or field that satisfies peer review and merits publication. The professional or applied doctorate (Prof D), on the other hand, is aimed at a research career in a profession/industry, designed around the development of high-level performance and innovation in an applied context with a combination of coursework and advanced research (minimum 60% of degree) and may include work-integrated learning. Although the level and academic requirements of these two qualifications are the same, their purposes and take-up or target audiences are different.

Supervising the PhD thesis by publication

Supervising the doctorate by publication is a 'hot' topic in postgraduate studies internationally. Institutional demands for shorter doctoral completion times and higher outcome rates, requirements towards greater accountability to governments and industry, more rapid and public dissemination of research results and the delivery of employment-ready researchers all drive the push towards publications.

Early publication also benefits students, supervisors/research teams, universities and doctoral education as a whole (see Frick, 2019). The PhD by publication aims to develop essential scholarly communication skills and the publication process seems key to further academic and research careers. In addition, early publication makes doctoral research accessible to wider audiences beyond the traditional thesis and adds to the scholarly standing of candidates, supervisor(s), research teams and universities. Publications as doctorates can also serve as a comparable standard of research excellence across disciplines and national systems, which is important, given the mobility of doctoral graduates (i. e. pre-, and hopefully post, Covid-19).

I have added quite a substantial section on the topic of the doctorate by publication as Chapter 4 in CUT's *Research Education Compendium* while there are also many useful articles available on the topic.

In conclusion

The four SRG topics covered by Module 1 were: 'the bigger picture' of supervision; some roles, models and styles of supervision; more specific supervisory roles, responsibilities and agreements; and the differences between master's and doctoral requirements, including supervising the doctorate by publication. These topics, as addressed by Webinar 1, might provide a better-informed perspective to less experienced senior degree supervisors as to what is expected at a minimum.

Module 2 will address a few supervision practices, including assisting research students with their study proposals; facilitating students' critical reading and helping them to build an argument; promoting students' literature reviews; guiding students in their research methodology decisions; and providing constructive feedback on students' work.

MODULE 2

Some supervision practices and skills

(Webinar 2)

Module 2 comprises five topics, namely:

- assisting students with their research proposals;
- facilitating students' critical reading and helping them to build an argument;
- promoting students' literature reviews;
- guiding students in their research methodology decisions; and
- providing constructive feedback on the work students submit.

I need to emphasise that these topics represent broad guidelines and definitely not 'recipes' to be followed. They are also non-exhaustive, meaning that there is much more to say and know about them (and other topics). I shall, however, try to keep to the essence, while knowing that different studies and different supervisors might allow for different emphases on these topics regarding specific needs and priorities.

Topic 2.1: Assisting students with their research proposals

The first formal step in any master's or doctoral study is to have a sound research proposal accepted by a proposals committee (or similar structure) that checks on the viability and quality of a proposed study using criteria such as:

- Is the project relevant and 'pitched' at the right level?
- Is the study doable? Is the scope of the study not too broad or too narrow?
- Are the research goals and objectives clear? Are the research questions or stated hypotheses clear?
- Were the relevant preliminary literature and other research issues related to the study properly addressed?

- Is the proposed research methodology appropriate for the proposed study?
- Has the relevant ethical issues and risks been properly considered and addressed?
- Are the timelines and budget for the project realistic?

To guide a senior degree student to write and defend a good research proposal often takes courage and patience from supervisors. Some students get their proposals accepted by proposals committees the first-time round while others need more time and guidance towards success. The CUT has its own set of protocols and forms regarding research proposals for master's and doctoral students, but below are a few generic questions that supervisors need to ask, and candidates need to respond to at the proposal stage of a study.

- What is your research about? What is your research statement? The student might be prompted to complete a statement such as the following: 'I am studying … (the topic), because I want to find out (the problem - what/why?) … in order to (justification/ rationale: why?) … by …. (broad approach/method: how?)
- What is the exact topic of the study? (Moving from a wider field of study to a narrower scope and topic – the so-called 'funnel'-approach)
- What is the background to your study? (What research does the study build on and what has caused the research problem or topic to be a novel and challenging one? What would happen or fail to happen if this problem is not solved, or the knowledge gap not narrowed?)
- What is the rationale for the research? (What makes the study a potentially good contribution to this field of inquiry? To whom would the research appeal and why is it important?)

- What, exactly, is the research problem? (The exact problem under investigation should be clearly stated in one or two sentences)
- What is the research aim of your study? (What does the study aim to achieve? One or two clear aims would suffice)
- What are the research questions or hypotheses? (Note that both cannot apply. For a typical study there are usually one main/primary question and three to four secondary/subsidiary questions. The number of hypotheses is determined by the key variables under investigation)
- What does relevant literature say about the problem/topic? What is your current conceptual understanding of the problem/phenomenon (conceptual/theoretical framework)? What is the 'theoretical lens' that you will be using for this study (especially true in the human and social sciences)?
- What appropriate research design and methodology will be applicable to this study? What literature support do you have for your methodological choices? Is your methodology described in sufficient detail (e. g. type of data, selection criteria, data procedures, data quality, data analysis)?
- Do you foresee any problems and/or challenges in generating the required data? Are there any ethical issues related to your study and what are the procedures you need to follow for ethical clearance?
- What is the potential contribution of your study? How are you going to execute and manage your study (action steps and timelines) and what is the budget/funding options for your study?

What had proved to be useful through the years was to alert prospective students to examples of good and successful research proposals to show what a sound study proposal could look like.

Finally, to get a student started on a research proposal one might ask him/her to complete the following basic statements and then work in more detail from there:

I am studying _____ (topic), because I want to find out _____ (problem statement - what/why?) in order to _____ (justification/rationale: what for/why?) by _____ (broad approach/method: how?)

Topic 2.2: Facilitating students' critical reading and helping them to build an argument

One of the best sources I have recently come across on argumentative thesis writing is the book by Wentzel (2018): *A Guide to Argumentative Research Writing and Thinking* (Routledge). Wentzel describes the research process 'as an argument' whereby the language of argumentation, the awareness of argumentation, the evaluation of arguments and the student's 'own voice' in the argument are discussed.

The book also elaborates on the so-called 'original contribution' of a study (especially in the case of doctorates), how to write the research design and methodology argumentatively and how to employ literature in building and explaining an argument. This is indeed a book that every senior student and study supervisor should read as it provides valuable ideas on how to guide students' argumentative reading and writing.

In senior degree studies, critical reading and argumentation involve a process of informed reasoning. Sometimes examiners point out that the student's main or central argument 'was (or was not) clearly and obviously sustained throughout the thesis.' This means that the central issue regarding the phenomenon under scrutiny was clearly visible and understandable (or the contrary) throughout the thesis or the series of articles, when the study is completed via publications.

For example: The strategic repetition of a key statement in a thesis such as: '*This thesis argues that becoming a learning organisation can contribute to the sustainability of small IT companies'*, contributes

to continuously reminding the reader/examiner of the main aim and focus of the study.

An argument could also be very specific, like in making a substantiated statement, providing a logical reason, or putting forward supporting facts for or against a point. For instance, a study might make a few strong points in favour or against a particular theory and thereby promoting persuasive discourse. To refer to the example above, a statement like the following becomes much more powerful and persuasive: 'This thesis argues that becoming a learning organisation can contribute to the sustainability of small IT companies because team learning, personal mastery and systems thinking increase innovation and flexibility'. Substantiated reasons for a research statement thus underscore the primary research statement which then leads to further inquiry.

What is further important is that the line of argumentation in a study should be maintained within every aspect of the study. For instance, Argument 1 may provide the rationale for the study and justify the chosen topic. Argument 2 follows by using relevant literature to situate and justify the study within a body of scholarship. Argument 3 justifies the study's theoretical approach or angle and Argument 4 justifies the study's methodology and methods. Finally, Argument 5 presents the 'thesis', i. e. providing a convincing argument for the significance of the study's findings. The argumentative line is thus systematically developed in the study, making it easier for examiners to observe the coherence and integrated nature of the study. Weak argumentative lines in a study cause a lot of loose ends and a lack of synthesis in a research report.

To follow on to Argument 2 and 3 above, supervisors need to guide their senior degree students to read relevant literature critically. This means that students need to demonstrate not only that they have read the literature, but that they can apply the literature critically to present a sound argument. Students need to be reminded that to merely report what other authors say, involves no criticality. Reading becomes only critical when the views or positions of different authors

are weighed against one another and when the student draws own conclusions based on different views within the context of a study.

One way of viewing lines of argumentation (also see Rule, 2019) is to proceed along the five key arguments in a thesis/dissertation as illustrated below:

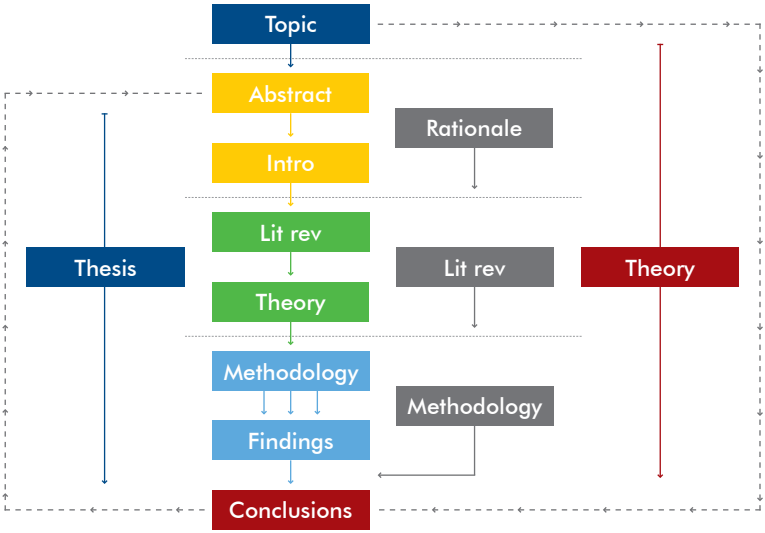


Figure 2.1: Building lines of argument throughout the thesis

Wentzel (2018) explains in his book quite clearly how to use and interpret relevant literature to build a sound argument. He also devotes a whole chapter on how to write an original and argumentative literature review that contributes to generating the student's own theoretical perspectives. Supervisors who advise accordingly will be much more satisfied with the study products of their senior degree students. I shall now elaborate somewhat on how to guide students' literature reviews.

Topic 2.3: Promoting students' literature reviews and helping them towards identifying a conceptual framework

Supervisors need to consider the following as an important point of departure when guiding students' in developing their theoretical perspectives on a topic by reviewing relevant literature.

A literature review represents a *process,* namely the process of finding, selecting, reading, understanding and reporting relevant sources of literature that are of direct concern to a particular study. The *result or outcome* of a literature review is what the student makes of the literature (forming her/his own theoretical perspectives) and how(s) he uses it to inform her/his theoretical understanding (theoretical/ conceptual framework) of the phenomenon under investigation.

It is only when a proper theoretical understanding of an issue or phenomenon is achieved (i. e. proper conceptualisation) that the student can make sound arguments for further empirical investigation and make sense of the study's findings. This is exactly why literature plays an important role from the initial research idea to the research proposal, and from the early stages of the research up to the very end of a study. Reviewing literature is thus not a 'once off' event, but a continuous process as a study evolves.

In literature studies (i. e., where a study is done solely by using literature) and grounded theory studies (i. e., where theory is generated via empirical data) literature plays a somewhat different role which is not discussed here. Here we only focus on the 'typical' use of literature and the 'literature review' within a study.

What advice would be beneficial if supervisors want their students to thrive in their exploration of literature? We look briefly at a few important issues.

(a) What does 'reviewing the literature' entail?

Reviewing literature not merely to consult a list of sources nor is it a summary of recent literature. It is a critical and analytical account of the most relevant and pertinent literature in relation to a particular theme or topic and forms the basis of an informed understanding of a particular topic or a phenomenon under investigation.

The *process* of reviewing relevant literature involves exploring literature sources to establish the *status quo*, formulate a problem or research inquiry and defend the value of pursuing a line of inquiry to compare findings/ideas with that of the researcher. The literature review as a *product* involves the synthesis of and a perspective on the work of others that demonstrates the accomplishment of the exploratory process. A literature review also informs the methodology and design of a study.

(b) What are the purposes of a literature review?

A literature review can:

- substantiate and contextualise a study;
- reinforce a proposition or a thesis;
- reveal the underpinning theories on which the research rests;
- pinpoint gaps in the research of a particular field;
- help to identify contradictory results and opposing findings;
- provide a broad overview of the published materials in any particular field/study area;
- help to identify appropriate research methods and techniques;
- help to establish a theoretical/conceptual framework;
- justify the need for the research; and
- help a student with good, scholarly writing.

(c) What criteria apply to a literature review?

Some of the criteria by which examiners judge literature reviews include:

- Comprehensiveness – appropriately accounts for past and present relevant literature, including seminal sources on the topic of the research.
- Specificity – the review is focused, accounting for relevant and pertinent sources on the research topic.
- Authority – the review includes authoritative authors and material in the field of study.
- Currency – represents recent thinking and writing in the field of study (note that 'recency' does not necessarily exclude 'older' sources if they are considered relevant or pertinent to a study).
- Availability – the review includes sources readily available to examiners and readers of the research report/thesis.
- Relevance and pertinence – sources need to be relevant and pertinent to the topic and excludes irrelevant/marginal literature.

(d) What is needed for a sound literature review?

To produce a sound literature reviews students need to:

- be familiar with a variety of information sources, including how to effectively use literature searches;
- understand the difference between trusted/reliable and untrusted/unreliable sources of literature;
- articulate their information needs to subject and research specialists;
- be able to read academic texts productively and use electronic tools (e. g. Mendeley, EndNote or others) to organise and record their literature sources; and
- realise the need for accurate and focused information (information drilling) to make educated and intelligent literature decisions.

(e) What are the possible deficiencies in a literature review?

Examiners have spotted deficiencies such as the following:

- Exclusion of landmark/seminal studies;
- Outdated material;
- A narrow-minded/parochial perspective;
- Not being sufficiently critical in dealing with literature;
- Not discriminating between relevant/marginally relevant/ irrelevant material;
- Lacking focus; and
- Lacking synthesis.

(f) How does a supervisor get a student started on a literature review?

At least four points need a mention:

Firstly, one technique that works well is to ask students to brainstorm robust questions that will help them to identify appropriate theoretical positions. Questions could include: Which authors relate best to my research questions/hypotheses? What research gaps have been identified by other researchers/authors in this field and on this topic? What are the key concepts that might guide my literature search and reading? What did other students in my field do to write sound literature reviews? What is the scope and boundaries of my study (what does it cover and what not)?

Secondly, another way of starting on literature reviews is to convene reading groups where students must read and orally share their interpretations of important articles in the field or within a larger theme. Students usually find this to be a 'safe' space to explore literature and to learn from one another. Asking students for short written pieces (critiques of several journal articles) in their own words can also help them to articulate their thoughts on what they have read.

Thirdly, supervisors may also explain to students how they themselves search for and read literature. They also listen carefully to the type of research story the student wants to tell and might use mind-mapping to structure a literature search or exploration. The structuring of a literature review in terms of headings and sub-headings early on can provide much needed guidance, but make sure that such a structure is flexible and can be changes at any point during the exploration of relevant literature.

Lastly, supervisors might encourage their students to write as much as possible while they explore the literature. They should not wait 'to read everything' before they write. Writing stimulates thinking about what has been read and promotes a reflective approach to literature searching and generating a conceptual framework for the study.

Conceptual frameworks (CFs) apply to all studies – especially at the doctoral level. In particular:

- A CF represents a conceptual map or 'a thinking tool', based on existing assumptions and (aspects of) theories in the field, that guides the whole research project
- A CF is derived from literature, experience and thinking about connections among concepts and theories and their relation to the research topic. CFs provide ways of linking theoretical perspectives within the research process.
- It fulfils an integrating function between theories and provides a 'scaffold' for the research design and fieldwork. It shapes research conclusions by emphasising conceptual significance and evidence.
- It links the chosen research paradigm, the research topic and the research process. It also introduces order, cohesion and rigour in the thinking and writing process, providing a conceptual thread to answer the 'why' questions of the research.

As indicated, CFs do not only emerge from reading relevant literature on a topic, but it also relates to the researcher's assumptions and experience as well as from reflecting on the topic. Where these elements overlap, as illustrated below, is where the CF emerges and where the key concepts or variables guide the whole study.

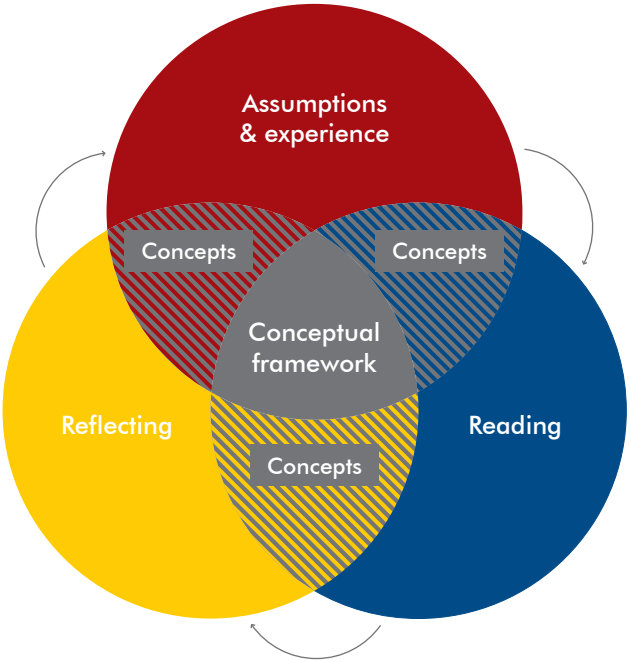


Figure 2.2: Source of conceptual frameworks

Relevant literature also helps students to identify possibilities and ideas about research methodology and study designs – a topic that is touched on next.

Topic 2.4: Assisting students with their research methodology decisions

The world of research has a unique vocabulary and to participate in research, research students need to know and use its 'language'. Research concepts, terms and questions that students often struggle with include:

- What is a 'research approach' and what is the logic behind different research approaches?
- What is a 'research paradigm' and do all research have to take a position from a paradigmatic perspective? How should a paradigmatic perspective(s) be accounted for in any given study?
- What is a 'research design' and how is a study designed by selecting a particular design type?
- What is a 'theoretical/conceptual framework', how is such a framework constructed where does it feature in a study?
- How accurate are research questions or research hypotheses formulated?
- What are the differences between 'research methodology' and 'research methods'?
- How is a methodology chapter in a thesis constructed (or, in the case of a thesis by publication, how should 'methodology' be reported overall)?
- How does one draw valid conclusions from research and reflect those in a thesis?

These are all questions that might be on the agenda at some or other stage of a student's research journey. Some supervisors find them quite easy to answer or explain or they might have been addressed in research methodology courses. What could be problematic is the reality that every study has its own peculiarities that do not necessarily suit the 'methodology mould'. At this point sound advice might keep

a student focussed [also see Lee (2020) for ideas and questions related to guiding students' research methodology].

Since research methodology spans such a vast terrain that cannot be properly dealt with under this topic, my advice would be to less experienced supervisors to recommend two or three really good and appropriate methodology books in their field to students and ensure that the students understand their contents. This can be facilitated by real-time group sessions where one or more methodological aspect that pertain to current studies are discussed. Students often learn from other students' questions, concerns or mistakes and within a particular field such discussions can be a valuable tool to promote understanding and new insights into methodological issues.

For some generic information on important research concepts, see *Bitzer (2020): Research Education at the Central University of Technology – A compendium for postgraduate students and study supervisors*. Sun Media: 2nd Edition.

What supervisors need to guard against is forcing their own views on research methodology on all their senior degree students. Over the years I have come across several students who revealed that according to their supervisor, there is only 'one acceptable way to do research in this field'. In many cases this has proved to be a parochial perspective as research methodology is an evolving field of study and what one supervisor knows or have learnt about research methodology might not be always suitable or applicable to a particular study. When unfamiliar with a particular methodology or design, supervisors should consult literature, approach other colleagues, or ask someone with appropriate methodological knowledge and experience to co-supervise the study (or, alternatively, a cohort of studies).

Topic 2.5: Providing students with constructive feedback on the work they submit

Effective, efficient and constructive feedback on their writing is probably one of the most important factors contributing to research students' study progress. Why is feedback, usually provided by Track Changes in chapters and theses, so important? Malcolm Knowles, a pioneer researcher in adult learning, has provided a few pointers.

Knowles indicates that for adults, such as senior degree students, timely and relevant feedback promotes their learning and interest. If the feedback is relevant to the research task at hand, adults become more needs-driven and goal-oriented. Furthermore, feedback that builds on the adult's previous knowledge and experience reinforces learning and improve sensitivity towards mistakes. In addition, feedback that is practical, clear, respectful, fair, and focuses on the adult learning task (not on the student as person) is likely to be more effective.

Why is feedback to research students sometimes less effective? Topical literature highlights that feedback can often be:

- overwhelming (too much to handle in one go or too many issues raised);
- complicated (issues highlighted are unclear and confusing);
- 'thin' (feedback says nothing or too little);
- too detailed (feedback focuses on detail and loses view of the 'bigger picture' of the study/problem);
- too global (feedback does not pay sufficient attention to detail);
- inappropriate (for the stage of research or research development of the student); and
- silencing (student experiences feedback as negative, insulting or destructive).

Ways and styles of providing feedback to students' writing obviously differ among supervisors and studies. In general, however, literature and experience have shown that the following guidelines might be useful:

- Supervisor feedback on a written chapter, for instance, should be given within three weeks. Circumstances might dictate, but students often lose interest if the feedback takes longer to appear. If one works with a co-supervisor, make sure that only one set of feedback is given and that nothing is seriously contradictory. Contradictory feedback confuses students and might hamper studies. This does not mean that differences in opinion or judgement will not occur, but students need to be clear what to fix/remediate after considering the feedback.
- Comments within chapters using Track Changes are useful, but supervisors have to ensure that comments are also added directly into the text so that the student cannot merely press the 'accept all' button and will thus be forced to read and respond to comments.
- Clear and detailed comments in chapters should be accompanied by an overall summary that highlights three or four main points that the student needs to work on. Students appreciate such summaries as it highlights the broader issues at stake.
- Supervisor needs to ask from students to respond to their feedback within a certain period (say, within a week or two) to make sure that all points have been noted and reacted upon. Students need to be reminded that mistakes which were pointed are not to be repeated. It is hugely frustrating for supervisors to point to the same mistakes occurring again and again.

As students are progressing along their research journeys, supervisor feedback should keep pace with such progress. For instance, initial feedback can be quite instructional or 'didactic' but needs to change in tone and nature as the study progresses and might become quite 'collegial' towards the end. Below are a few examples of feedback styles.

Didactic (supervisor 'teaches')

Example: "Your summary of Chapter 1 should be no longer than 500 words. It must be concise, clear and accessible to your readers. Look at summaries in previous studies".

Prescriptive (supervisor prescribes a solution)

Example: "No, do not separate the results part from the interpretation and the discussion. These need to be woven together".

Informative (supervisor requires information or more information)

Example: "This statement can be further supported by using references to authors such as xxx and yyy".

Confronting and challenging (supervisor follows up a student's ignorance of a previously mentioned point)

Example: "This seems to be something we have discussed earlier. I have already indicated that this approach/technique/model would not work. Please revise".

Tension-relieving (supervisor desensitises an earlier difficult exchange)

Example: "Oh no! Not one of these charts/tables/figures again! Where do you manage to get all of these?"

Encouraging and facilitating (supervisor spurs the candidate on)

Example: "I see you have elaborated extensively on policy documentation here. Could you also indicate any contradictions or similarities in these policy statements?"

Eliciting (supervisor tries to draw out further comments)

Example: "How would this statement make more sense if properly contextualised? Could you explore new categories of meaning here?"

Supporting (supervisor helps nurturing the emerging scholarship)

Example: "Yes, you have responded to this part of your data in a systematic, yet critical and evaluative manner. It would be interesting to see how you pull this through to your conclusions chapter".

Summarising (supervisor encourages student to 'pull things together', mark a stage or to consolidate)

Example: "You have rightly explored a range of concepts and definitions here. Can you consolidate all of this by pointing out the key concepts and providing your own definition?"

Clarifying (supervisor supports clarification of terms, arguments, designs, models, etc.)

Example: "You have done well in explaining xxx in the previous section, but it is unclear as how this links with yyy in this section. Please better clarify your position here to your reader".

Collegial exchange (supervisor promotes scholarly dialogue that aims at research independence)

Example: "This aspect of your study is really making much sense now. One wonders how the interpretation of the results would have looked through the lens of ZZZ's theory. Any ideas on this? Maybe over Zoom later in the week?"

In conclusion

Module 2 has dealt briefly with five relevant topics, namely how supervisors can assist senior degree students with their research proposals, facilitating students' critical reading and helping them building an argument, promoting students' literature reviews and generating a conceptual framework for a study, assisting students with their decisions on research methodology and providing them with constructive feedback on their work. Module 3 will address the assessment of senior degree work before students submit for examination and using examination criteria to promote a sound examination outcome. Assessing students' work throughout their studies and before they submit for examination is key to the quality assurance of studies.

MODULE 3

Assessing senior degree work

(Webinar 3)

Topic 3.1: Assessment of students' work before a thesis/dissertation is submitted for examination

Before a student is granted permission to submit his/her work for examination, a supervisor needs to make final checks on whether a dissertation or thesis is ready for examination. Although examiners are provided with typical institutional, faculty or departmental examination criteria, rigorous research is what examiners hope to find in a thesis. Two indicators of rigorous research are *integration* and *cohesion*. Trafford and Leshem (2011:157) remind us that if these are present, then the thesis will display other positive features of intellectual grasp, engagement with the literature, grasp of methodology and presentation (see Figure 3.1 below and Trafford & Leshem, 2011).

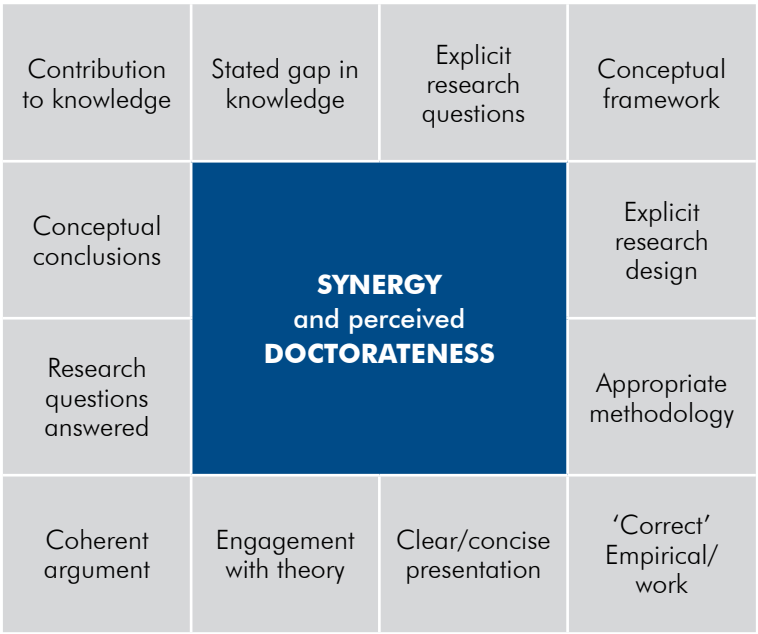


Figure 3.1: Scholarly components of 'doctorateness'

The consequence of such desirable features is that the research is likely to have made an original contribution to knowledge or understanding of the subject in topic area, in method, in experimental design, in theoretical synthesis or engagement with conceptual issues. If these features are evident, then the thesis or parts of it will also demonstrate the potential for publication.

Trafford & Leshem (2011) refer to terms such as 'auditing' and 'monitoring' to remind supervisors to check students' work for examination readiness. Students also need to be reminded that checking their research and the dissertation/thesis is a regular part of their study journey. The main purpose of this 'checking for coherence and internal consistency' is to ensure that elements in one part of the thesis are consistent with relevant elements in other parts.

Practical actions that senior degree students constantly need to be reminded of, include:

- To make checking an integral part of their approach to undertaking research;
- To allow time for checking the text as they plan, draft, or revisit a chapter;
- To confirm that what they have done, are doing or will do is what was intended;
- To recognise deviations from the study plan and then decide whether these are to be accepted or corrected to correspond with the plan;
- To avoid leaving checking until it is too late to change or adapt what have been done; and
- To discuss findings with you as supervisor(s) or trusted critical friend(s) to receive opinions from others on what their checks show.

These 'checkpoints' are simple for students to use and practical in consequence as they do not take up much time. Collectively, they can help students to avoid those unnecessary mistakes that sometimes occur in dissertations/theses. Checking will provide students and

supervisors with self-generated evidence about the quality of the research and the dissertation/thesis. However, it is essential that as students self-evaluate their work, and discuss it with you as supervisor, you both are prepared to recognise the weaknesses and strengths of a particular study.

Spending time on 'checking' activities will pay dividends for both students and supervisors, because

- it provides a diagnosis of the status/quality of the research and the dissertation/thesis
- it represents an agenda of items to be discussed between supervisor(s) and student(s) to take corrective action
- it builds students' self-confidence in recognising the quality of their work
- it deepens students' understanding of research as a process and prepares them to defend their work publicly
- it presents both supervisors and students with evidence to account for academic progress.

A useful tool that can serve as a 'checking device' for integration and coherence in a piece of presented research is the so-called 'magic circle'. Trafford & Leshem (2011:165 - 167) explain this useful instrument as follows:

Each researcher should be able to describe a pattern, a reasonably regular way in which they go about their research. If students can draw practical links between the various stages and components of their and make them explicit, examiners can trace their conceptual interconnectedness. If such signposts are offered within a dissertation/thesis, readers can decide whether a piece of work is credible or not. When research is viewed as a system of interconnected parts, then it can be portrayed as in Figure 3.2.

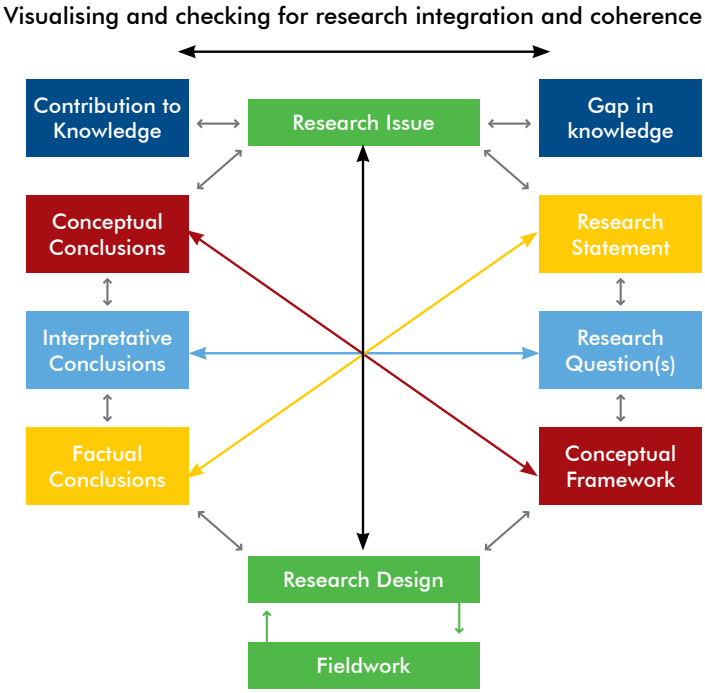


Figure 3.2 The magic circle – a 'checking' device (Trafford & Leshem, 2011)

To explain briefly:

There are two possible starting points for the sequence. The student may have an idea about a possible research topic. Thinking more about it and reading opens the topic and as a supervisor and researcher in the relevant field you might appreciate that it represents a gap in knowledge. Alternatively, students often may suspect, know about or even stumble on a knowledge gap in your area of interest. As a gap in knowledge, the student could then refine that into a specific research issue to be investigated. Either way, he/she will journey between these two factors as you assist in establishing boundaries for the research topic.

Moving clockwise around the model shows that the research statement is derived from the research issue. This statement is normally expressed as a single sentence encapsulating answers to the questions regarding the research topic. It may be a challenge to students to capture all their research intentions in one sentence. But one may argue that if it takes more than one sentence then the research constitutes multiphase piece of work that is somewhat more extensive than intended. Alternatively, if a student has not thought the issue through clearly enough, she/he should do so to produce a satisfactory and workable research statement.

Producing research questions that are clear and capable of being answered leads the student into the theoretical perspectives gleaned from the literature. In turn, this enables him/her to devise a conceptual framework which is central to how the research is designed. The iterative relationship between fieldwork and research design acknowledges how these features influence each other throughout the duration of a research project.

The data that are collected enable a student to generate factual, interpretive, and conceptual conclusions. These conclusions should allow one to make a modest, reasonable and defensible claim for a contribution to knowledge that closes or narrows the gap in knowledge. Your contribution to knowledge should also relate specifically to the originating research issue and its boundaries. This closes the circle of your research.

While the circle of factors offers a neat picture of the research, there is another far more important level of meaning latent inside the circle. The four diagonal double arrow-headed lines connect pairs of factors that are influential on one another. These are:

- **Research issue – research design**:
  You should be able to show how the boundaries and focus of the issue are apparent in how the research was designed. The result of this is that the fieldwork should be seen to investigate and gather data on that issue and not some other issue. This represents a check on the internal empirical consistency of your research (Rose, 1982: 32) (see also Chapter 5).

- **Research statement – factual conclusions:**
  You should be able to show how the research statement relates directly to the factual conclusions that are drawn from your evidence. Both are concerned with fact – what is to be investigated and the facts that were found that related to that statement. The direct relationship between these two research components demonstrates that your research possesses internal empirical consistency.

- **Research questions – interpretive conclusions:**
  Answers to your research questions should emerge as you interpret, analyse and discuss your evidence. This relationship represents a higher level of thinking than the descriptive text that is associated with the previous pair of factors. It demonstrates the internal theoretical consistency of your research.

- **Conceptual framework – conceptual conclusions:**
  This relationship determines the scholarly and theoretical level of your research. Among the set of conclusions, it is the most critical, since it demonstrates the relationship and relevance of your research to other, external, research and extant theories.

The model enables students and supervisors alike to plan both an integrated and coherent piece of research. It also enables the checking of the consistency of how that plan was carried out and thus verify whether a dissertation/thesis accounts for essential scholarly research features. Undertaking these checks and activities should provide for the necessary confidence that a study is methodologically and otherwise rigorous. This closes the circle of research as a process.

In summary, a supervisor needs to check for positive features in a dissertation/thesis before it is sent off for examination. These features include:

Demonstration of intellectual grasp

- The student clearly grasps the scope and possibilities of the topic and he/she shows diligence and rigour in research procedures and problem solving.
- The student's work shows tangential areas for possible relevance and he/she grasps the wider significance of the topic – for instance, how the analysis of the data relates to its methodological and epistemological context(s).
- The work shows iterative development, allowing for exploration and rejections of alternatives, while the study possesses an internal dialogue – for instance, showing plurality in considering approach/method and validation of the one finally chosen.
- The student treats a broad theoretical base critically and demonstrates a coherent and explicit theoretical approach, fully thought through and critically applied, also noting its limitations.
- The work gives a systematic account of the topic, including a review of all plausible possible interpretations, showing mastery of the topic, including that the (doctoral) candidate is now an 'expert in the field'.
- The study indicates the future development of the work and maintains clear and continuous links between theory, method(s) and interpretations.
- The student presents a reflexive, self-critical account of relationships involved in the inquiry and of the methodology, theory and practice are clearly connected, and the work displays intellectual rigour.

Demonstration of research coherence

- The study displays coherence of structure (for instance, the conclusions follow clearly from the data and the findings).
- The student skilfully develops different angles, theoretical lenses or perspectives (which are sometimes limited by the length of the work).

- The study is cogently organised and communicated, possessing a definite agenda and an explicit structure.
- The study presents a sense of the researcher's learning as a journey, as a structured, incremental progress through a process of both argument and discovery.

Demonstration of an engagement with literature

- The study displays comprehensive coverage of the field and a secure command of the literature in the field, showing the breadth of contextual knowledge in the discipline.
- The student successfully critiques established positions and engages critically with other significant work in the field.
- The study also draws on literature with a focus different from the viewpoint pursued in the thesis, maintaining a balance between delineating an area of debate and advocating a particular approach.
- The student includes scholarly notes, a comprehensive list of references and accurately uses academic conventions in citations.

Demonstration of a grasp of methodology

- The research methodology is clearly established and applied, including providing indications of how methodological decisions were made and how ethical norms and procedures were adhered to.
- If applicable, the study uses several appropriate sets of data for verification/triangulation.

Demonstration of scholarly presentation

The written thesis:

- is clear, easy to read and is presented in an appropriate style;
- contains few errors of expression; and
- displays flawless literacy and technical accuracy.

Topic 3.2: Interpreting master's and doctoral examination criteria and promoting students' writing and publication efforts

Each university has its own set of general guidelines for examiners of senior degrees and each faculty/school may equally have a set of criteria and guidelines. Below (see Figure 3.3) is a sample set of typical master's degree examination criteria. The set distinguishes between three master's options, namely the master's by coursework accompanied by a (50%) mini thesis, the master's by full (100%) thesis and the master's by publication.

At the doctoral level one key criterion that all examiners are applying in some or other way is 'originality of the contribution'. This means a significant contribution to learning, for example through the discovery of new knowledge, the connection of previously unrelated facts, the development of new theory or the revision of older views. The work may build new knowledge by extending previous work or 'putting a new brick in the wall'. It may use original processes, create a new synthesis, explore new implications for practitioners, policy makers or theorists, it might revise a recurrent issue or debate by offering new evidence, thinking or theory, and it might replicate or reproduce earlier work but applied to a different place or time with a different sample. Finally, it needs to be authentic – the student's own work.

(A set of sample examination criteria for master's studies appears in Annexure A and for a doctorate in Annexure B)

In reference to the roles of supervisors (see Module 1), and when it comes to the examination stage of a study, Lee (2020:293) suggests several key activities of importance by following her model of supervision roles as explained earlier (see Figure 3.3).

Functional

Ensure that the assessment criteria are clear. Ensure that the timetable is clear. Give all the assessors all the information they need. Enable formative assessment and feedback for the student in good time.

Enculturation

Encourage students to pre-assess each other's work against the assessment criteria. Get previous students to talk about their experience of the assessment process. Rehearse the process with a group of students.

Critical thinking

Explore the implications of the assessment criteria early on. Get the students to identify the questions they might be asked. Rehearse the process and reflect on it afterwards.

Emancipation

Involve the students in the design of appropriate assessment criteria. Help the students to pre-assess their own work and identify how secure they felt about each judgement. Help the student to learn from any failure. Rehearse the process

Relationship development

Ensure that no student could believe that a personal relationship with any other student might prejudice the assessor's judgement. Ensure that students feel that you recognise the work they have put in, as well as affirming success and helping them to learn from any difficulties.

Figure 3.3 Different roles of supervisors during the examination stage of a study (Lee, 2020: 293)

Lee (2020) points out that within any examining system we, as senior degree supervisors, are all strategic learners to some extent, so being clear about how work is going to be examined and assessed is an important part of research supervision. Of course, much depends on academic or scholarly judgement, such as whether a piece of work adequately demonstrates mastery of methodology or whether contains a sufficient contribution to original knowledge, but there is a great deal that we can explain to our students early on about how their work will be assessed, which will help them to work towards a successful completion and graduation.

In conclusion

Thus far we have considered the contexts wherein senior degree supervision takes place (Module 1). We have also looked at modes and models of supervision as well as supervisory styles, roles, and responsibilities. We have touched briefly on the differences between master's and doctoral studies.

In Module 2 a few supervisory practices and skills came under the spotlight: Guiding students' research proposals, facilitating students' critical reading and helping them to build an argument, promoting students' literature reviews, assisting students with their research methodology decisions, and providing them with constructive feedback on submitted work.

This module (Module 3) has dealt briefly with the assessment or checking of students' work before their thesis/dissertation is submitted for examination and assisting students to understand how examiners may apply examination criteria to their studies. Obviously, supervisors have major responsibilities when it comes to the assessment stage of a study. We need to ensure that the thesis/dissertation clearly displays the elements that demonstrate 'mastery' in the case of a master's degree and 'doctorateness' in the case of a doctoral degree. A thesis/dissertation should also display the features of integration and coherence among its constituting elements while we need to assure that students have adhered to relevant examination criteria and guidelines. If we fail to do so, we set our students up for failure

or for a huge amount of additional work and time – something which no-one enjoys.

Module 4 will address the final two topics, namely how supervisors can assist their students with the timely and successful completion of their research projects by promoting and applying sound project management skills while also considering their research students' post-qualification career options and opportunities.

MODULE 4

‘Other’ important roles and tasks of supervisors

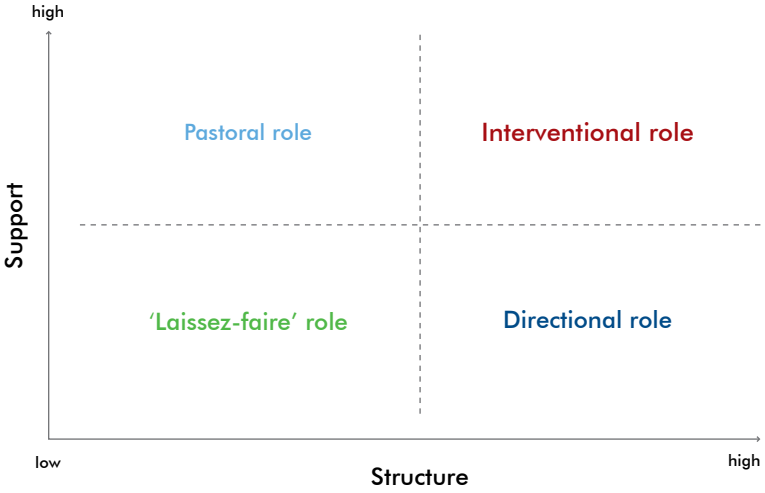
(Webinar 4)

This module deals with two further important roles and tasks of senior degree supervisors, namely how supervisors can assist their students with the timely and successful completion of their research projects and keeping 'an eye on the future', whereby research supervisors should act as facilitators of research students' post-qualification career options and opportunities.

Topic 4.1: Promoting timely and successful completion of research projects through project management

Supervisor roles

Every research student needs to manage their projects well to enhance timely completion at a level of expected quality and in this sense senior research students are expected to be project managers. Often, however, students lack the skills of project management and may need support from their supervisors. In Webinar 1 we have referred to the two main roles of a study supervisor namely providing structure and providing support (see diagramme below).



When much structure and support are needed, the supervisor's role is to intervene. If the intervention relates to project management, it means that the student does demonstrate project management skills such as managing time, keeping to agreed dates, handling academic or material resources, or properly scheduling their research activities.

Similarly, if a student or a cohort group needs even more structure (but less support), the supervisor(s) should direct the research process more stringently to prevent fallout or waste. Hopefully, such a supervisory role/position is the exception, but sometimes this might be necessary to salvage a project or a study.

The 'pastoral' role/position is more directed at the personal level, but what happens sometimes is that students experience challenges in their personal lives that may have a direct bearing on their studies. Such circumstances call for supervisors to be more empathetic and supportive to get the student back on track.

The 'laissez-faire' (let go) role/position implies that the student or the cohort group functions extremely well from a project management perspective and may need very little structure and support. In most instances this is seldom the case and supervisors must be careful to make assumptions about their students' progress without frequent reality checks.

Project management tools

Research projects involve careful planning, the efficient use of resources and much care about accuracy and quality. All these elements point to managerial competence in research. Such competences are often lacking – in students and even sometimes in supervisors. Managerial competences thus should be learnt prior to and during research education. Holzbaur et al. (2013) provides a few valuable pointers for research candidates and their supervisors which could be useful towards effective research project management. He suggests, among other things, attention to the 'project triangle', which consists of (a) an envisioned quality result, (b) the resources needed to achieve such a result and (c) the timelines for achieving the result.

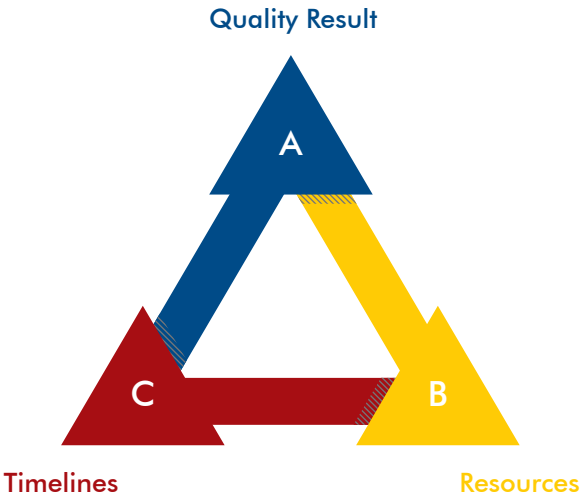


Figure 4.1: The project triangle (Holzbaur et al., 2013)

A. In the case of master's or doctoral projects, a quality result will be a successfully completed thesis and, preferably, some publications that accompany the thesis. The student should thus be guided towards a clear vision for her/his study, what the study project will contribute and whether the study product will meet the review criteria from scholarly peers and experts in the field of study.

B. In terms of study resource management there is always money involved, time is a crucial resource and infrastructural resources such as research hardware and software, library resources, laboratory resources (where applicable) as well as physical spaces conducive to study projects need to be negotiated and managed. In some (or all) of these aspects senior degree students may need some guidance where and when applicable.

C. Since time is such a crucial resource in senior degree studies, careful planning and scheduling of project time is vastly important. Budgeting time for each step of the research process, as well as for unforeseen events, is crucial for the timely completion of studies. This is not only important for the individual study project manager (student/supervisor), but also for the university as an institution since time,

quality and subsidy funding for studies go hand in hand. Students may be directed to relevant sources or institutions could make useful time planning tools available such as Gantt charts and other devices.

The Holzbaur triangle (Figure 4.1) covers a plane that represents the research process itself and whereby the research project, in broad terms, entails the identification of a researchable problem, a suitable methodology, sound evidence, accurate evaluation of the evidence and drawing meaningful research conclusions based on the evidence.

From a research education perspective, research project management might also be represented as a 'staircase' (see Figure 4.2 and Holzbaur et al., 2013: 39) of research management skills whereby research management is configured as an upward path towards achieving research outcomes and which supervisors may assist students to grasp early in their projects. My version of the 'staircase' configuration differs slightly from that of Holzbaur as represented in Figure 4.2 and is briefly discussed below.

Figure 4.2 Research management steps towards study success (adapted from Holzbaur et al.,2013)

Starting at the baseline

- Study success and the management of the study project starts with a study plan (study proposal) that needs to be driven by the curiosity of the candidate and the ability to produce an efficient study plan. This is the first step towards study success and where all good research studies start.
- The second step is to thoroughly explore literature relevant and pertinent to the study. This process of exploration within the study project needs to be managed well. Systematic reading, efficient use of time and resources as well as conceptualising, theorising and economically communicating insights and ideas all form part of the research project which needs to be managed.
- Based on literature exploration, a third step is to make informed methodological choices to embark onto the empirical part of the study. Implementation and use of applicable research methods require effective and efficient management as they pertain to the data generated. Tools and instruments to collect, interpret

and present data might often pose management challenges to students.

- Following on generated data, the processes of analysis, synthesis and evaluation of data towards findings and information need to be managed. Development of analytical skills, reflective skills and communication skills are required.
- How the new information from the study is applied and communicated to scholarly or professional audiences and peers needs to be managed to gain approval of peers in the field towards success. Managing the examination and the wider dissemination processes successfully provides for the final step: Study success!

Prolonged studies

A paper by Motseke (2016) highlights some reasons why adult learners who study part-time for their master's and doctoral qualifications are taking longer to complete their studies. The factors reported as problematic for senior degree students living in townships were as follows:

- a lack of research skills;
- inadequate computer skills;
- a lack of internet connectivity; and
- stress and work pressures.

Results from Motseke's study revealed that most participants did not have the basic research skills required for the level of study prior to embarking on their master's or doctoral studies. Research education before taking up their degrees was considered as inadequate as their basic research skills were not developed from an early stage. The lack of research experience also created communication problems between them and their supervisors as the participants reported that their supervisors assumed that they were conversant with basic research. In their feedback and discussions supervisors thus simply used research concepts which participants did not understand. Cultural and language differences also played a part.

A shortage of suitably qualified and experienced supervisors, as well as supervisors that were overloaded with too many students to supervise posed a challenge. Although the participants in the study indicated that their supervisors displayed professionalism and a caring attitude, the supervisors' lack of knowledge about township living negatively affected their ability to adequately guide students from disadvantaged backgrounds.

What also stood out was students' limited access to internet connectivity which posed a serious problem. Although many participants in the study reported that they could write reports using a computer, they could not handle tables, graphs and complicated statistical operations needed for their postgraduate studies.

Work and family pressures contributed negatively to the completion rates of the students. As the ages of the study participants ranged between 37 and 61, they had families and stable jobs in most cases, even holding key positions at their workplaces. Since the responsibilities of work and family were already demanding, their studies added an additional 'burden' to cope with. This was particularly true for female participants involved in family care and management.

Most study participants however reported to have enjoyed their studies, especially those whose studies were relevant to their work situation and improved their employment opportunities. What they have pointed out is that better preparation for undertaking research at senior degree level might be needed for a smoother 'transition' into research and to assist them with managing their research projects.

Project management knowledge and skills

Project management is an important topic for those eager to manage their research projects well. Study supervisors should thus advise their students to acquire some project management skills, even at undergraduate level, to run their projects and their lives more smoothly. Some supervisors or university support services even offer workshops or short courses in project management to assist in this respect.

Both supervisors and senior degree students should constantly learn and discover new and established project management tools and techniques to gain an understanding of a project life cycle. Especially if they are aiming at becoming independent researchers themselves. Transferable skills, building and leading project teams, handling time and budget constraints, personal management, and offering and communicating workable solutions to stakeholders might all be part of such an endeavour.

A study by Katz (2019) found that doctoral students do not learn such skills readily. His study involved 1570 doctoral students across universities from Israel and Western Europe and its main finding is that most PhD students, regardless of their chosen academic field or the region where they study, had no training or expertise in managing a doctoral research project. Based on these findings, the article suggests that all doctoral candidates be taught basic project management skills for better managing their research towards successful completion.

Managing a research project as a student or managing a few research projects as a supervisor seems inevitable for the successful completion of senior degree studies. In Webinar 4, participants mentioned the following typical managerial roles of supervisors:

- **Managing time** – own time as well as the time of students.
- **Managing resources** – including budgets and expenditure for research projects, especially where laboratory and field work are involved.
- **Managing people** – including communication, relationships, conflict, and others.
- **Managing quality** – in terms of ensuring and enhancing the quality of research processes and research outputs.

Obviously, there are many other roles in project management as they relate to research projects. Hendrickson (2008) indicates that a project is of a focused and limited nature (see Figure 4.3, centre), while the project manager draws on general (institutional and

other) management support (upper left circle), acquires specialist knowledge and skills (of which management is only one) to execute and complete the project (upper right circle) and using related disciplinary knowledge and skills to support the project (bottom circle). Project management, adapted for research management, thus intersects with other areas of management and expertise and these areas need to be of quality to ensure a sound research process, outcome and product.

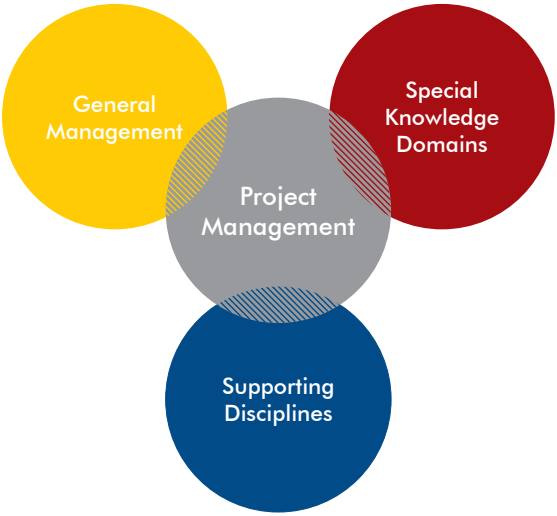


Figure 4.3 Basic Ingredients in Project Management (Hendrickson 2008, 2)

Along the same lines, Wysocki, Beck and Crane (2000) suggest that project managers need to operate at different 'levels' to be effective. These include managing the strategic, control, technical, commercial, organisational and human/people aspects of a project as the examples in the figure below suggest. Without going into detail here one might say that supervisors as project managers need to apply these managerial skills to their own research projects and guide their students to manage their research projects in similar fashion.

Strategic	Vision for success; The bigger research picture, Project quality; Risk management; Ethics.
Control	Research schedule; Progress monitoring; Information and data management; Change and contingency management.
Technical	Research design; Testing and modelling; Literature searches and reviews; Managing and checking writing; Lab and/or field management.
Commercial	Procurement; Dissemination; Entrepreneurial activities; Patenting; Legal.
Organisation & People	Supervisory structure; Project teams; Peer and other support; Institutional structures.

From my own experience I can highlight three points regarding the management of limited research projects such as senior degree studies.

- Firstly, senior degree students should constantly be guided and reminded to learn and develop their own project management skills and techniques to gain an understanding of the project life cycle (i. e., initiating the project, planning the project, executing and controlling the project, and closing the project) - especially at the level of the doctorate where they need to become independent researchers themselves.
- Secondly, developing transferable skills with research students are non-negotiable. These include learning how to operate as part of a project team, handling time and budget constraints, personal management, managing the quality of a project, and disseminating and communicating workable solutions to relevant audiences (e. g. industry, professions).

- Thirdly, to remain motivated for their research, students need to acquire and maintain a 'bigger picture' perspective that emphasises the end product (thesis, contribution, solution to a problem) rather than the research process, but also a view of their future career and progress as a researcher to properly position themselves and their studies, visualising success. This might be somewhat different for master's studies since those students are still in the process of mastering methodology rather than contributing to the field of research.

This brings us to the final topic, which briefly focuses on the supervisor's role beyond the actual study or project, namely, to enhance students' post-qualification career options and opportunities. The implication here is to promote the discipline or field or research as a scholar and mentor, and not merely operate as someone who assists students towards completing their studies.

Topic 4.2: An eye on the future (The research supervisor as facilitator of research students' post-qualification career options and opportunities.)

(What follows below was largely adapted from: Lee, 2020, Chapter 10.)

What is the research for?

The question 'what is my research for?' is one that needs to be asked early on by every master's or doctoral student. Current thinking links all levels of higher education to employability and, although critics of the neoliberal world find this excessively performative, it is also true that most of our students doing research will need to find some form of remunerative employment after completing their studies. It is their research that is the aspect of their studies that is most likely to open doors to employment in the future.

Research is important to students' future careers

Some ways in which senior degree research are important include:

- It demonstrates problem-solving skills and (in the case of doctorates) research independence
- It opens the door for networking opportunities
- Their research is something that they can talk about enthusiastically and knowledgably at interviews

There is evidence that research placements work-related research aid employability and that research projects can either be a significant part of a placement, a master's or doctorate as part of a joint project or opening doors to working with or interviewing those from a world which the research student might ultimately like to join.

Some international views on employment for senior graduates

The Council for Graduate Schools in the USA has recently published part of its investigation into career pathways and found that those studying arts and humanities degrees believe that their studies at this level had prepared them well for their current job. This became even more valued eight to fifteen years after graduation (*https://cgsnet.org/and-outside-academia-humanists-say-their-phd-programs-prepared-them-well*). The rest of this three-year study will be published shortly (*https://cgsnet.org/understanding-career-pathways*).

A different type of survey is carried out annually by the Australian government, showing that over 83% of students were in professional occupations within four months of completing their higher degree by research. Moreover, over 80% were employed full-time (*https://docs.education.gov.au/system/files/doc/other/higher_degree_by_research_students_satisfaction_outcomes.pdf*).

Identifying the risks – choosing the right topic

The financial advantages to careers of undertaking senior degree research seems to become clearer, especially for women. However, even where post-PhD employment rates are good, earning is not guaranteed. It thus seems vital to make sure that work on the most appropriate and relevant research topics and use it to explore their career options and create networks from the beginning. Even if they do not yet know what they want to do with the rest of their lives (thereby being in the majority), developing research skills and exploring all avenues will help them find out.

Aiming for an academic career

The supervisor of a student doing research often has a difficult role in supporting the candidate who actively wants an academic career. We are seeing that in many disciplines and in many countries where the opportunities for joining the professoriate are limited, but it is not impossible. We want to encourage informed aspiration. Anne Lee's five approaches to supervising research can help us to untangle some opportunities here.

Functional
Identify 'preparing to teach in HE' programmes and support attendance on them. Give access to sample CVs and explain the typical recruitment procedure.

Enculturation
Arrange for mentoring.
Encourage networking.
Support getting published early.
Involve in grant applications

Critical thinking

Encourage candidate to analyse the market for academic posts in his/her discipline over time. How mobile is the successful academic in his/her field? What other attributes do successful academics have?

Emancipation

Encourage investigation of a wide range of possible institutions, roles within them, career paths and future research.

Relationship development

Discuss own career path. Arrange for candidate to meet other friends and colleagues who are willing to do similar.

Recognising the transferrable skills that are being developed

Vitae.ac.uk have done much work in identifying transferrable skills at doctoral level, and many of these can be usefully applied at other curriculum levels as well. The Researcher Development Framework (see figure below) was introduced where the inner circle refers to the four domains covering the knowledge, behaviours and attributes of researchers. It sets out the wide-ranging knowledge, intellectual abilities, techniques and professional standards expected to be able to do research, as well as the personal qualities, knowledge and skills to work with others and ensure the wider impact of research. Within each of the domains there are three sub-domains and associated descriptors.

The framework was derived from semi-structured interviews with researchers, literature reviews, reports, sector-wide consultations and expert panel review. Its aim is to identify attributes in a non-judgemental, inclusive and forward-looking manner. Other work

suggests that non-academic roles where a PhD is sought might prioritise three aspects of the RDF (and combinations of them), namely technical skills, social skills and project management skills.

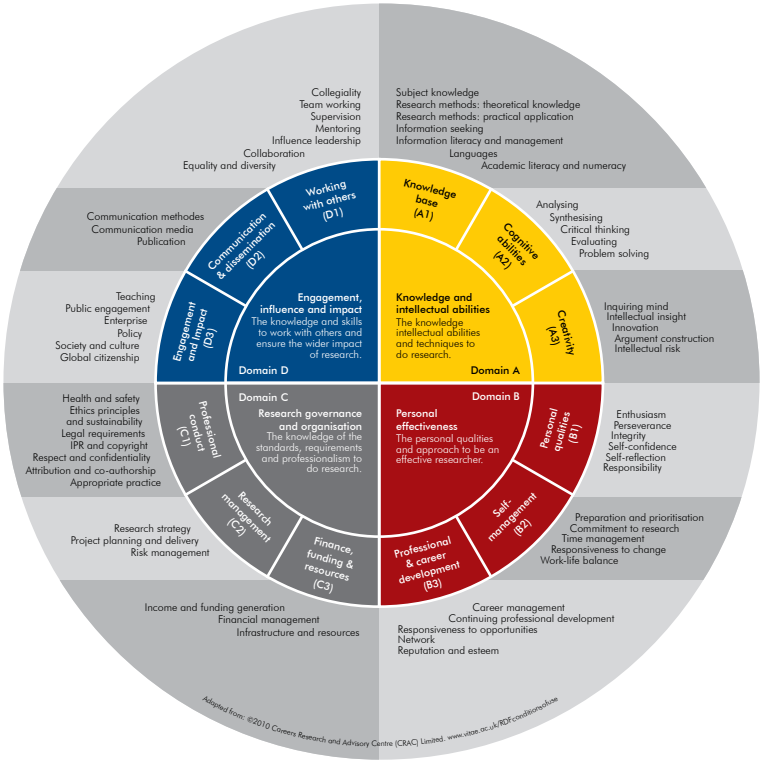


Figure 4.4 The Researcher Development Framework

A role for the entrepreneurial researcher

The move to flatter organisations and portfolio careers has focused some universities to look at encouraging entrepreneurialism. They have collaborated with various institutions to establish business incubators (see, for example, the University of Bristol's 'SETsquared' partnership with local businesses and regional universities: *www.bristol.ac.uk/business/resources-facilities/grow-business/*).

Walsh, Hargreaves, Hillemann-Delaney and Li (2015) identified differing attitudes to the word 'entrepreneurship' between Chinese and British doctoral students working in STEM subjects. The Chinese students saw entrepreneurship as a more worthwhile endeavour, involving a positive attitude towards networking and creating diverse friendship groups, and linked to social as well as commercial development. The British doctoral candidates were more likely to have a negative attitude towards entrepreneurship and define it in terms of commercial games. Nearly 80 per cent of their sample of Chinese doctoral students (n=114) expected to be involved in entrepreneurial activities in the future, compared with 28 per cent of the British candidates (see *https://doi.org/10.1080/03075079.2013.842219)*

A focus on entrepreneurialism is also reflected in the lens especially created by Vitae.ac.uk to explore the attributes gained by researchers that can be applied to the entrepreneurial worker. They call this the 'enterprise lens'. It emphasises such attributes as the ability to sustain relationships with stakeholders, supporting knowledge transfer, knowledge of the principles behind intellectual property, financial management and resilience.

[See *www.vitae.ac.uk* (accessed 23-06-2021)].

Supporting research career planning

Research supervisors may consider the following questions:

(1) When in the supervisory process should I start talking with my students about post-graduation career options?

(2) In how many ways can I help my researcher students to plan their careers?

(3) How can the candidate identify their own strengths, weaknesses, interests and options?

(4) What sort of plan should the candidate be putting together?

The supervisor's role in helping a doctoral graduate to plan their career is becoming more prominent and needs discussion between the candidate and the supervisory team. The candidate needs to be prompted to think about their possible career options early on so that they can think how to use their research to support or widen those options.

There are several different ways that a supervisor might approach supporting a candidate (especially at the doctoral level) to think about their career in terms of Anne Lee's five approaches to research supervision.

Functional

Does your institution have a specialised post-graduate careers advisor? What online career tools are available? Is there a generic tool available for analysing training needs or any gaps in transferable skills? Are the mock interviews available?

Enculturation

Introduce the candidate to previous graduates so they can talk about a range of careers option. Encourage the candidate to widen their network; introduce them to your network. What work experience is available? Encourage exploration of the careers of successful role models that appeal to the candidate.

Critical thinking

Look at local, national and international patterns. Where are the opportunities? Explore all the options including: academic; academic-related, non-academic research posts, professional, charitable, business, public-service-related options. Collect a range of adverts and job descriptions to compare them against the answers to the self-audit questions.

Emancipation

Encourage the candidate to explore and audit their own interests, strengths and weaknesses by asking them:

1. What are you good at?
2. What are your interests, motivations and values?
3. What do you most enjoy at university?
4. What kind of lifestyle do you want?
5. What do you want from your career?

Help the student to identify the criteria that are important to them and complete a decision chart.

Relationship development

Describe your own career path and what made you make various decisions. Encourage the candidate to share their experiences with you and offer feedback. Offer to carry out or organise mock interviews. Discuss the style and content of any presentations to be made.

South African doctorates and employability

Professor Brenda Wingfield, Vice President of the Academy of Science of South Africa and DST-NRF SARChI chair in Fungal Genomics, Professor in Genetics, University of Pretoria asks the following questions in an 2019 article (*https://theconversation.com/why-phds-are-good-for-individuals-and-for-a-country-123935*):

- What is the value of a PhD?
- Is there a need in the developing world or a country to undertake a PhD study?

It is expensive (around R1 million per graduate) to undertake postgraduate studies and in many regards a luxury for students from poor families. Even for those who have better access to funding there is a very real cost in tuition, costs of the research as well as years lost with regards to climbing the career ladder. As students in the southern

hemisphere consider their senior degree study options, it is worth revisiting the pros and cons of doing a PhD.

From an individual perspective, says Prof Wingfield, there are good and bad reasons to undertake a PhD. The *good reasons* include achieving a significant goal in terms of a research output, publications and in many cases solving an important problem. Doing research towards a PhD allows one to be curious, literally every day. It is also the first step in becoming part of the global network of researchers. Becoming part of a global community can be very gratifying.

The *bad reasons* would include the assumption that having a PhD will earn you a larger salary. This is not always the case. Another is peer pressure which can lead students to register for a PhD. Sometimes the pressure comes from family. Another not so good reason is when people decide to do a PhD because they do not like the job that they are doing. Undertaking a PhD study should only be considered if you are passionate about research and understand that it really takes a huge amount of time and energy. It is after all the ultimate degree – there are none higher.

The value of senior degree qualifications

In the final analysis one might say that there is no 'magic' about the master's or the PhD qualification. It does not make you a better or smarter person. However, people who have PhDs, for instance, have shown a certain capacity and tenacity and have the degree to prove it. Many other people might have the equivalent capacity and tenacity but without the degree it is less easy for employers to identify them.

The South African government has identified that producing senior degree graduates is an important goal. For instance, the Department of Science and Innovation has suggested that universities need to increase their output of PhD graduates to 100 graduates per million people. At the moment South Africa has 46 doctoral graduates per million people, this is one tenth of the figure for Switzerland (465) and United Kingdom (409). The new target would take the expected output to more than 5000 PhD graduates every year. In 2018 the

number of PhD graduates across universities in South Africa was just over 3000.

The South African government's argument is that senior degrees are seen as drivers of the academic pipeline. If we focus on getting more PhDs, for instance, universities will also increase other graduates in the pipeline. While one may support the idea of PhDs being a driver, the current targets will probably not be achieved for many years and the quality of degrees is also a major concern if we start chasing numbers.

In conclusion

To conclude, one might say that all countries need strong comprehensive universities – institutions that do more than just educate students to the bachelor's degree level. To have a substantive research output a university must have academics with PhDs who can become supervisors for senior degree studies. That implies building vibrant postgraduate programmes accompanied by a strong focus on developing supervisory capacity. This supervision development programme is part of such a worthy endeavour at the Central University of Technology.

A few useful sources on Research Supervision

Below are a few sources that might be useful for early career researchers relatively new to supervision to consult in conjunction with the Supervisor Resource Guide. There are also some relevant sources listed in the CUT Research Education Compendium (2020) published by African Sun Media (see first reference below).

Generic books and monographs on supervision

Bitzer EM. (2020): *Research Education at the Central University of Technology – A compendium for postgraduate students and study supervisors.* Sun Media: 2nd Edition.

Lee A. (2020). *Successful Research Supervision: Advising students doing research*. Routledge. 2nd Edition.

McKenna S, Clarence-Fincham J, Boughey C, Wels, H & Van den Heuvel H. (2017). Strengthening Postgraduate Supervision. African Sun Media. *https://postgradcollaborations.com/wp-content/uploads/2020/05/Strengthening-Postgraduate-Supervison-Final.pdf*

Taylor S, Kiley, M & Humphrey R. (2018). *A Handbook for Doctoral Supervisors*. Routledge. 2nd Edition.

Trafford V & Leshem S. (2011). *Stepping-stones to achieving your doctorate: By focusing on the viva from the start.* Maidenhead: Open University Press. Third imprint.

Wisker G. (2012). *The good supervisor*. Basingstoke: Palgrave Macmillan. 2nd Edition.

Books related to supervisor conferences

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Postgraduate Supervision: Future foci for the knowledge society. *https://books.google.co.za/books?id=Kuu9DwAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0*

Pushing Boundaries in Postgraduate Supervision. *https://books.google.co.za/books?id=0mZBAwAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0*

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Lee, A. (2018). How can we develop supervisors for the modern doctorate? *Studies in Higher Education,* 43(5): 878 – 890.

Generic websites/blogs on supervision

The Supervision Whisperers. *https://thesupervisionwhisperers.wordpress.com/contact/?contact-form-id=3&contact-form-sent=2110&contact-form-hash=a8f4d5ccd73e27a35031a9e58a6fd6f2a954b7d7&_wpnonce=37d25e7093#contact-form-3*

For students and supervisors:

- *http://postgradenvironments.com*
- *https://thesiswhisperer.com*
- *https://doctoralwriting.wordpress.com*
- *https://patthomson.net*
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https://www.uc.pt/en/fctuc/dei/ensino/doctoral_program/PhDprop4

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Supervising literature reviews

Look for recent and useful publications at:
https://uk.sagepub.com/en-gb/eur/disciplines/P16

Guiding master's dissertations

Look for recent and useful publications at:
https://uk.sagepub.com/en-gb/eur/doing-your-masters-dissertation/book225694

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Promoting students' research careers

Careers in research:

www.rcuk.ac.uk/skills/percase/booklets/

Include booklets on careers in: history, social science, physics, engineering, environment, biology, chemistry, and many more.

Career stories on film:

www.vitae.ac.uk/researcher-careers/researcher-career-stories/list-of-vitae-career-stories-on-film/vitae-career-stories-on-film-list

(Updated on 23 June 2021)

Annexure A

Sample assessment criteria for a mini-thesis M (coursework M), full thesis M and full thesis M by publication (RW = Relative weight of criterion)

50% Mini-thesis M	RW	Full thesis M	Full thesis M by publication
Generic criteria			
Title and topic: the title clearly reflects the study, and the topic is worthy of research.	5	**Title and topic:** the title clearly reflects the study and the topic is worthy of research.	**Title and topic:** the title clearly reflects the study, and the topic is worthy of research.
Style of writing: the research report is written in an academic style but is not necessarily suitable for publication purposes.	5	**Style of writing:** the research report is written in an academic style and is overall suitable for publication purposes.	**Style of writing:** the research report is written in an academic style and is highly suitable for publication purposes as peer-reviewed published conference proceedings, journal articles and/or book chapters.
Use of sources: the references reflect an acceptable spectrum of consulted sources which include relevant primary sources in the study terrain. The report shows signs that the student can interpret, integrate and critically use the literature to a limited extent.	10	**Use of sources:** the reference list reflects a wide spectrum of relevant sources which covers a wide array of sources in terms of relevance, time period and source types. The report shows clear indications that the student is able to scientifically interpret and critically engage. with the consulted literature.	**Use of sources:** the reference list reflects a relatively complete spectrum of relevant sources which covers the study terrain well and provides a basis from which new knowledge can be generated. The report shows clear indications that the candidate can scientifically interpret and critically evaluate the consulted literature and, where necessary, provide his/her own scholarly point of view.
Editing: the research report adheres to the minimum requirements of text editing, which includes a title page, content page(s), list of abbreviations, suitable referencing technique, figures and tables, as well as a faultless reference list.	5	**Editing:** the research report meets the minimum requirements of text editing which include the requirements as indicated for the mini-thesis M.	**Editing:** If papers have been submitted for publication, are in press, or have been published already, the required format of the different publishing outlets may be followed, or a unified style throughout the manuscript may be preferred. The final manuscript still needs to contain a title page, content page(s), list of abbreviations, suitable referencing technique, figures and tables, as well as a faultless reference list (which may be distributed amongst the different chapters).

50% Mini-thesis M	RW	Full thesis M	Full thesis M by publication
Continuous focus: the research report is coherently presented and shows a clear and continuous focus or main argument.	5	**Continuous focus:** the research report is coherently presented and shows a clear continuous focus or main argument.	**Continuous focus:** the research report is coherently presented and shows a clear continuous focus or main argument. The final manuscript consists of two wrap-around chapters – the first is an orientation to the study, and the last an integrated response to the research purposes / questions / hypotheses. The manuscript must have a **minimum of TWO distinct chapters** in the form of peer-reviewed publishable and/or published conference proceedings, journal articles and/or book chapters.
Clear problem formulation: the chosen research problem is of a limited nature and scope, but clear and unambiguous. The research purpose / aim / question / hypothesis is well formulated.	10	**Clear problem formulation:** the research problem is of a more extensive nature and scope, and clearly and unambiguously stated. The research purpose / question/ hypothesis is well formulated.	**Clear problem formulation:** the research problem is of an extensive nature and scope for a Master's by full thesis, properly contextualised, relevant and worthy of research, shows some evidence of original thought, and is clearly and unambiguously stated. The research purpose / question / hypothesis is well formulated. The various peer-reviewed published and/or publishable conference proceedings, journal articles and/ or book chapters included may address different aims/questions/ hypotheses, but an overarching purpose/question/hypothesis guides the study and provides a golden thread by which each of the peer-reviewed published and/or publishable conference proceedings, journal articles and/ or book chapters are linked. The introductory chapter should clearly explain this logic according to which the manuscript is structured. This chapter must also contain an explanation of the gap in the literature that this study addresses as well as an explanation of the methodological orientations that underpin the study. If based on empirical work, a succinct logical exposition of the methods and data analysis employed during the research must be provided.

50% Mini-thesis M	RW	Full thesis M	Full thesis M by publication
Suitable response on the research purpose/ question / hypothesis: the research report provides limited, but responsive and well-articulated answers to the stated research purpose / question/ hypothesis.	10	**Suitable response to the research purpose/ question / hypothesis:** the research report provides accounted and well-articulated answers to the stated research purpose / question / hypothesis and shows significant scientific insights and thought.	**Suitable response to the research purpose/ question / hypothesis:** the research report provides accounted and well-articulated answers to the stated research purpose / question / hypothesis and shows evidence of original and creative scientific insights and thought.
Methodological suitability and clarity: the researcher shows clear evidence of a scientifically grounded research design, mastery of the methodological foundation, as well as a thorough description of the chosen research method(s) and suitable alignment to the research problem investigated.	10	**Methodological applicability and clarity:** the researcher shows clear evidence of a scientifically founded research design, an extensive mastery of the methodological foundation, as well as a defence of the chosen research method(s) and suitable alignment with the type of research problem investigated.	**Methodological applicability and clarity:** the researcher shows clear evidence of an extensive scientifically founded and accounted research design, extensive and thorough mastery of the methodological foundation, as well as a critical and insightful defence of the chosen research method(s). The chosen research design and methods is suitably aligned with the nature of the problem investigated. An introductory chapter which provides an orientation to the study provides an overview of the research design and methodology, which may be expanded upon in greater depth within the various peer-reviewed publishable and/or published conference proceedings, journal articles and/ or book chapters.
Effective reporting of findings, conclusions and implications of the study: the research report shows clear evidence of congruence/ alignment with the problem statement and the purpose of the study, scientifically founded findings and a clear indication of the implications of the study for theory, and/ or practice.	15	**Effective reporting of findings, conclusions and implications of the study:** the research report shows clear evidence of congruence/alignment with the problem statement and the purpose of the study, scientifically grounded findings and a clear indication of the implications of the study for theory and/or practice.	**Effective reporting of findings, conclusions and implications of the study:** the research design shows clear evidence of congruence/alignment with the problem statement and purpose of the study, scientifically founded findings and thorough and insightful accounted implications for both theory and practice are provided. Reporting of the findings, conclusions and implications may be distributed across several peer-reviewed publishable and/or published conference proceedings, journal articles and/or book chapters, but a final chapter provides an integrated overview of these aspects.

50% Mini-thesis M	RW	Full thesis M	Full thesis M by publication
Ethical accountability: the research report shows evidence that the student took ethical requirements and guidelines into account and completed the research project accordingly.	5	**Ethical accountability**: the research report and the oral examination shows evidence that the student has the capacity to adhere to ethical requirements, as well as taking autonomous ethical decisions which contributes to the ethical standards of research.	**Ethical accountability**: the research report as well as the oral examination shows the candidate's capability to adhere to ethical requirements, take autonomous ethical decisions, and promote the process of ethical decision-making of this nature. Terms of authorship are clearly demarcated – either papers included are single authored (by the candidate), or when co-authored by the supervisor(s), the candidate's contribution is specified.
Distinctive criteria			
General impression: The student succeeds in systematically mastering the existing literature in the field of study with a clear consciousness of the current problems and insights. The study contributes in a *limited way* to the conceptual and/or empirical application(s) in the discipline/field of study or terrain of professional practice. The research methods were effectively considered and applied, and data were suitably and effectively analysed and interpreted. Deductions, conclusions and implications rest on thorough conceptual and/or empirical findings and are aligned with the research problem and purpose.	15	**General impression**: The student exceeds in systematically mastering the existing literature in the field of study with a clear *critical, in-depth and independent* consciousness of the current problems and insights, as well as theoretical and/or empirical application in the discipline/ field of study or terrain of professional practice. The research methods were effectively considered, and applied and the data were effectively analysed and interpreted. Deductions, conclusions and implications rest on the thorough theoretical and/or conceptual findings and are aligned to the research problem and purpose. There are indications of publishable elements from the study.	**General impression**: The candidate succeeds in systematically synthesising the existing literature in the field of study and with a clear *critical and questioning orientation* regarding current and new problems and insights. The *research gap* which the study addressed is clearly demarcated, as well as appropriate conceptual and/or empirical application in the discipline/field of study or terrain of professional practice. New and *challenging* conceptual thoughts and insights on the field of study or applications thereof come to the fore. The candidate succeeds in clearly demonstrating the specific criteria for an MEd (full thesis). Included chapters (except for the wrap-around chapters) are suitable for publication, have been submitted for publication, or have already been published as published conference proceedings, journal articles, and/or book chapters.
Length: Limited (80 – 120 pp. or 20 000 – 30 000 words)	5	**Length**: Less limited (120 – 200 pp. or 40 000 – 60 000 words)	**Length**: Substantial, but length depends upon allowed word count for different publication types.

50% Mini-thesis M	RW	Full thesis M	Full thesis M by publication
Assessment: The following symbols apply: 1 – If minor editorial changes are made to the thesis to the satisfaction of the supervisor(s), the degree is awarded. 2 – If specific factual or textual changes to the thesis are made to the satisfaction of the supervisor(s), the degree is awarded. 3 – The candidate revises the thesis and re-submits it for re-examination. 4 – The degree is not awarded.		**Assessment**: Successful defence of the main argument, the procedures and the findings of the study. The following symbols apply: 1 – If minor editorial changes are made to the thesis to the satisfaction of the supervisor(s), the degree is awarded. 2 – If specific factual or textual changes to the thesis are made to the satisfaction of the supervisor(s), the degree is awarded. 3 – The candidate revises the thesis and re-submits it for re-examination. 4 – The degree is not awarded. **NOTE:** The final assessment of the study does NOT necessarily represent the assessment of the majority of examiners. The final result depends preferably on a CONSENSUS DECISION of the examination panel after completion of the oral examination.	**Assessment**: Successful defence of the main argument, the procedures and the findings of the study. The following symbols apply: 1 – If minor editorial changes are made to the thesis to the satisfaction of the supervisor(s), the degree is awarded. 2 – If specific factual or textual changes to the thesis are made to the satisfaction of the supervisor(s), the degree is awarded. 3 – The candidate revises the thesis and re-submits it for re-examination. 4 – The degree is not awarded. **NOTE:** The final assessment of the study does NOT necessarily represent the assessment of the majority of examiners. The final result depends preferably on a CONSENSUS DECISION of the examination panel after completion of the oral examination.
	100		

	Specific criteria for full M thesis	Specific criteria for full thesis M by publication
Mark allocation for a Master's thesis: Pass (50 - 59%) if the research report meets all the above-mentioned requirements. Pass with merit (60 - 74%) if the research report exceeds above-mentioned criteria. Pass with distinction (75% and more) if the research report exceeds the above-mentioned criteria by far.	**Independent scientific thought and argumentation:** both the research report (thesis) and the candidate (in the oral examination) provide proof of independent thought and argumentation in the field of study.	**Independent scientific thought and argumentation:** both the research report (wrap-around chapters and collection of papers) and the candidate (in the oral examination) provide proof of independent thought and argumentation in the field of study.
	Contribution to the terrain of study/knowledge on the terrain of study: the study clearly shows proof of an original conceptual, methodological, empirical and/or practice-oriented contribution to the terrain of study. The candidate is capable of pointing out, accounting for, and defending this contribution.	**Contribution to the terrain of study/knowledge on the terrain of study:** the study clearly shows proof of an original conceptual, methodological, empirical and/or practice-oriented contribution to the terrain of study. The candidate is capable of pointing out, accounting for, and defending this contribution.
	Potential publish-ability of the research – the research report shows clear proof of publication potential or have already lead to publications from the study in the form of published conference proceedings, journal articles and/or book chapters.	**Potential publish-ability of the research:** the research report shows clear proof of publication potential or have already lead to publications from the study in the form of published conference proceedings, journal articles and/or book chapters.
	Originality and creativity: the study report as well as the candidate (during the oral examination) shows clear proof of original thought and new insights into the terrain of investigation. Creative thought comes to the fore through new combinations, designs, applications or insights which extend the thoughts and applications in an accountable manner in die field of study.	**Originality and creativity:** the study report as well as the candidate (during the oral examination) shows clear proof of original thought and new insights into the terrain of investigation. Creative thought comes to the fore through new combinations, designs, applications or insights which extend the thoughts and applications in an accountable manner in die field of study.

Annexure B

Sample evaluation criteria regarding the traditional PhD (by dissertation) and PhD by publication (RW = Relative weight of criterion)

PhD Dissertation	RW	PhD Dissertation by publication
Generic criteria		
Title and topic: the title clearly reflects the study and the topic is worthy of research.	5	**Title and topic:** the title clearly reflects the study and the topic is worthy of research.
Style of writing: the research report is written in an academic style and is highly suitable for publication purposes.	5	**Style of writing:** the research report is written in an academic style and is highly suitable for publication purposes as peer-reviewed published conference proceedings, journal articles and/or book chapters.
Use of sources: the reference list reflects a relatively complete spectrum of relevant sources which covers the study terrain well and provide a basis from which new knowledge can be generated. The report shows clear indications that the candidate can scientifically interpret and critically evaluate the consulted literature and provide his/her own scholarly point of view.	10	**Use of sources:** the reference list reflects a relatively complete spectrum of relevant sources which covers the study terrain well and provide a basis from which new knowledge can be generated. The report shows clear indications that the candidate can scientifically interpret and critically evaluate the consulted literature and provide his/her own scholarly point of view.
Editing: the research report adheres to the minimum requirements of text editing, which includes a title page, content page(s), list of abbreviations, suitable referencing technique, figures and tables, as well as a faultless reference list.	5	**Editing:** If papers have been submitted for publication, are in press, or have been published already, the required format of the different publishing outlets may be followed, or a unified style throughout the manuscript may be preferred. The final manuscript still needs to contain a title page, content page(s), list of abbreviations, suitable referencing technique, figures and tables, as well as a faultless reference list (which may be distributed amongst the different chapters).
Continuous focus: the research report is coherently presented and shows a clear and continuous focus or main argument.	5	**Continuous focus:** the research report is coherently presented and shows a clear continuous focus or main argument. The final manuscript consists of two wrap-around chapters – the first is an orientation to the study, and the last an integrated response to the research purposes / questions / hypotheses. The manuscript must have a **minimum of THREE distinct chapters** in the form of peer-reviewed publishable and/or published conference proceedings, journal articles and/or book chapters.

PhD Dissertation	RW	PhD Dissertation by publication
Clear problem formulation: the research problem is of an extensive nature and scope, properly contextualised, relevant and worthy of research, shows evidence of original thought, and is clearly and unambiguously stated. The research purpose / question / hypothesis is well formulated.	10	**Clear problem formulation**: the research problem is of an extensive nature and scope, properly contextualised, relevant and worthy of research, shows evidence of original thought, and is clearly and unambiguously stated. The research purpose / question / hypothesis is well formulated. The various peer-reviewed published and/or publishable conference proceedings, journal articles and/or book chapters included may address different aims/questions/hypotheses, but an overarching purpose/question/hypothesis guides the study and provides a golden thread by which each of the peer-reviewed published and/or publishable conference proceedings, journal articles and/or book chapters are linked. The introductory chapter should clearly explain this logic according to which the manuscript is structured. This chapter must also contain an explanation of the gap in the literature that this study addresses as well as an explanation of the methodological orientations that underpin the study. If based on empirical work, a succinct logical exposition of the methods and data analysis employed during the research must be provided.
Suitable response to the research purpose/ question / hypothesis: the research report provides accounted and well-articulated answers to the stated research purpose / question / hypothesis and shows evidence of original and creative scientific insights and thought.	10	**Suitable response to the research purpose/ question / hypothesis**: the research report provides accounted and well-articulated answers to the stated research purpose / question / hypothesis and shows evidence of original and creative scientific insights and thought.
Methodological applicability and clarity: the research report shows clear evidence of an extensive scientifically founded and accounted research design, extensive and thorough mastery of the methodological foundation, as well as a critical and insightful defence of the chosen research method(s). The chosen research design and methods are suitably aligned with the nature of the problem investigated.	10	**Methodological applicability and clarity** – the research report shows clear evidence of an extensive scientifically founded and accounted research design, extensive and thorough mastery of the methodological foundation, as well as a critical and insightful defence of the chosen research method(s). The chosen research design and methods are suitably aligned with the nature of the problem investigated. An introductory chapter which provides an orientation to the study provides an overview of the research design and methodology, which may be expanded upon in greater depth within the various peer-reviewed publishable and/or published conference proceedings, journal articles and/or book chapters.
Effective reporting of findings, conclusions and implications of the study: the research design shows clear evidence of congruence/ alignment with the problem statement, purpose of the study and research questions, scientifically founded findings and thorough and insightfully accounted implications for both theory and practice are provided.	10	**Effective reporting of findings, conclusions and implications of the study**: the research design shows clear evidence of congruence/ alignment with the problem statement and purpose of the study, scientifically founded findings and thorough and insightfully accounted implications for both theory and practice are provided. Reporting of the findings, conclusions and implications may be distributed across several peer-reviewed publishable and/or published conference proceedings, journal articles and/or book chapters, but a final chapter provides an integrated overview of these aspects.

PhD Dissertation	RW	PhD Dissertation by publication
Ethical accountability – the research report as well as the oral examination show the candidate's capability to adhere to ethical requirements, take autonomous ethical decisions, and promote the process of ethical decision-making of this nature.	5	**Ethical accountability** – the research report as well as the oral examination show the candidate's capability to adhere to ethical requirements, take autonomous ethical decisions, and promote the process of ethical decision-making of this nature. Terms of authorship are clearly demarcated – either papers included are single authored (by the candidate), or when co-authored by the supervisor(s), the candidate's contribution is specified.
Distinctive criteria		
General impression: The candidate succeeds in systematically mastering the existing literature in the field of study *in depth* and with a clear *critical and questioning orientation* regarding current and new problems and insights. The *research gap* which the study addressed is clearly demarcated, as well as *in depth* conceptual and/or empirical application in the discipline/ field of study or terrain of professional practice. New and *challenging* conceptual thoughts and insights in the field of study or applications thereof come to the fore. The candidate succeeds in clearly demonstrating the specific criteria for a PhD study below. There are distinct possibilities for publication from the study, or aspects may already have been published.	20	**General impression**: The candidate succeeds in systematically mastering the existing literature in the field of study *in depth* and with a clear *critical and questioning orientation* regarding current and new problems and insights. The *research gap* which the study addressed is clearly demarcated, as well as *in depth* conceptual and/or empirical application in the discipline/field of study or terrain of professional practice. New and *challenging* conceptual thoughts and insights in the field of study or applications thereof come to the fore. The candidate succeeds in clearly demonstrating the specific criteria for a PhD study below. Included chapters (except for the wrap-around chapters) are suitable for publication, have been submitted for publication, or have already been published as published conference proceedings, journal articles, and/or book chapters.
Scope: Substantial (200 – 300 pp. or 70 000 – 90 000 words)	5	**Scope**: Substantial, but length depends upon allowed word count for different publication types.
Assessment: Successful defence of the main argument, the procedures and the findings of the study. The following symbols apply: 1 – If minor editorial changes are made to the dissertation to the satisfaction of the supervisor(s), the degree is awarded. 2 – If specific factual or textual changes to the dissertation are made to the satisfaction of the supervisor(s), the degree is awarded. 3 – The candidate revises the dissertation and re-submits it for re-examination. 4 – The degree is not awarded. **NOTE:** The final assessment of the study does NOT necessarily represent the assessment of the majority of examiners. The final result depends preferably on a CONSENSUS DECISION of the examination panel after completion of the oral examination.		**Assessment**: Successful defence of the main argument, the procedures and the findings of the study. The following symbols apply: 1 – If minor editorial changes are made to the dissertation to the satisfaction of the supervisor(s), the degree is awarded. 2 – If specific factual or textual changes to the dissertation are made to the satisfaction of the supervisor(s), the degree is awarded. 3 – The candidate revises the dissertation and re-submits it for re-examination. 4 – The degree is not awarded. **NOTE:** The final assessment of the study does NOT necessarily represent the assessment of the majority of examiners. The final result depends preferably on a CONSENSUS DECISION of the examination panel after completion of the oral examination.
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Specific criteria for the PhD study	Specific criteria for the PhD study by publication
Independent scientific thought and argumentation: both the research report (dissertation) and the candidate (in the oral examination) provides proof of independent thought and argumentation in the field of study.	**Independent scientific thought and argumentation**: both the research report (wrap-around chapters and collection of papers) and the candidate (in the oral examination) provides proof of independent thought and argumentation in the field of study.
Contribution to the terrain of study/knowledge on the terrain of study: the study clearly shows proof of an original conceptual, methodological, empirical and/or practice-oriented contribution to the terrain of study. The candidate is capable of pointing out, accounting for, and defending this contribution.	**Contribution to the terrain of study/knowledge on the terrain of study**: the study clearly shows proof of an original conceptual, methodological, empirical and/or practice-oriented contribution to the terrain of study. The candidate is capable of pointing out, accounting for, and defending this contribution.
Potential publish-ability of the research: the research report shows clear proof of publication potential or has already lead to publications from the study.	**Potential publish-ability of the research**: the research report shows clear proof of publication potential or has already lead to publications from the study in the form of published conference proceedings, journal articles and /or book chapters. If chapters have not been submitted or accepted for publication, the candidate needs to clearly indicate to which publication outlet such chapters will be submitted. All intended or actual publication outlets must contain an element of peer review.
Originality and creativity: the study report as well as the candidate (during the oral examination) shows clear proof of original thought and new insights into the terrain of investigation. Creative thought comes to the fore through new combinations, designs, applications or insights which extend the thoughts and applications in an accountable manner in the field of study.	**Originality and creativity**: the study report as well as the candidate (during the oral examination) shows clear proof of original thought and new insights into the terrain of investigation. Creative thought comes to the fore through new combinations, designs, applications or insights which extend the thoughts and applications in an accountable manner in the field of study.

This generic Supervision Resource Guide supplements a series of four webinars that were facilitated in the first semester of 2021 and repeated during the second semester. Webinar activities involved senior degree supervisors who are early career researchers and relatively new to the task of supervising. The Guide involves brief notes and information based on the four webinars, each addressing several issues of supervisory concern. Since the Guide is generic in nature it does not address any discipline or field-specific issues, which is the concern of individual faculties, departments and research units.

The Guide contains four modules, comprising 13 relevant generic topics. These modules are: (1) The 'bigger picture' of research supervision; (2) Some supervision practices; (3) Assessing senior degree work; and (4) 'Other' important tasks of study supervisors. The Guide is accompanied by a list of potentially useful references to books, articles and websites. It thus serves as a basic resource and will be updated after the next round of webinars in 2022.

Eli Bitzer is Professor Emeritus in higher education studies and a past director of the Centre for Higher and Adult Education at Stellenbosch University, South Africa. He has been a study leader to 92 master's and doctoral graduates and contributed over 90 articles to scholarly journals and chapters to academic books. He also chaired four international conferences on postgraduate supervision and published widely on the topic. Eli facilitates workshops on postgraduate education and supervision and has a keen interest in promoting the quality of higher education in South Africa.

Orchid: https://orcid.org/0000-0003-4081-8053

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