BrieflySpeaking

CHE

COUNCIL ON HIGHER EDUCATION

Number 25
September 2023

Models of Postgraduate Supervision and the Need for a Research-rich Culture

Abstract

Rapid increases in postgraduate numbers have led to questions about the best models to be used in supervision. Across the world there has been a move away from the one-on-one model of postgraduate supervision to cohort, team, and project-based approaches to providing support to master's and doctoral students. This *Briefly Speaking* reviews the literature on these models and the benefits and concerns related to each. The argument offered is that postgraduate students need to undertake their studies within a research-rich culture with multiple opportunities to see research being modelled, to practice their own knowledge creation attempts, and to get feedback from peers and expert researchers. It is not only the supervision model used but also the research culture in which it is implemented that has implications for the experience of the postgraduate scholars.

Keywords: Collaborative models, postgraduate, one-on-one model, research, supervision.

Introduction

While the scholarship of teaching and learning has typically focused on undergraduate pedagogy, in recent years the spotlight has turned to postgraduate education. The rise in literature on postgraduate studies has paralleled the enormous growth in master's and doctoral enrolments around the world. One of the topics interrogated within this literature is the variety of models of supervision. In this *Briefly Speaking*, the various models of postgraduate supervision are introduced alongside some of the advantages and disadvantages of each as noted in this literature.

The literature clearly evidences a worldwide move to more collaborative approaches to postgraduate education. The drivers of such moves are multiple

and include the idea that the traditional one-on-one model of postgraduate supervision is inefficient, inappropriate for some forms of knowledge making, and can be a major factor in the so-called 'lonely scholar' experience of postgraduate education.

While this piece of *Briefly Speaking* offers some insights into the various models in use around the world, the argument made is that it is not the model of postgraduate supervision that matters so much as the research culture in which the supervision takes place. By drawing on the literature, this *Briefly Speaking* ends with a consideration of the ways in which research-rich cultures can be nurtured in higher education institutions.

Growth in postgraduate numbers in South Africa

Postgraduate enrolments have increased rapidly across the South African higher education sector in the last decade. The National Development Plan (2012) calls for 5 000 doctoral graduates to be produced per year by 2030. When the plan was published, this seemed like an unrealistic target given that the country produced only 1420 doctoral graduates that year. However, in 2020, the country produced 3 546 doctoral graduates (CHE 2022a) suggesting that the higher education system is on track towards meeting this target .

A key driver of the increases in enrolment of postgraduate students is the national funding formula which, since its implementation from 2004, has rewarded postgraduate enrolments and graduations in ways that encourage universities to increase postgraduate intake. This has been implemented with the understanding that having a critical mass of highly educated citizens is crucial in a 'knowledge economy' with doctoral graduates seen to be "the drivers of new knowledge production" (NDP 2012: p. 267).

This significant rise in postgraduate enrolments and graduations needs to be applauded, but caution is needed given some concerns expressed in the national report following the recent national review of South African doctoral qualifications undertaken by the Council on Higher Education (CHE). The report from the national review notes several quality issues pertaining to the doctorate and suggests that "in almost all the HEIs … increases in student numbers have put a lot of strain on the institutional systems" (CHE 2022b: 15).

The report further suggests that in some cases universities may be taking in students without having the necessary supervision capacity and that incentives to increase postgraduate numbers may bring about unintended consequences:

One university reported that the incentivisation of supervision had previously become problematic, where supervisors may take on supervision of excessive numbers of students in order to receive the incentives, which were paid into personal accounts. (CHE 2022b: 20).

The CHE (2022a) indicates that 49% of permanent academic staff in public universities in South Africa hold doctorate degrees, though given the high percentage of academics employed on contract,

the real percentage is likely to be lower. This would explain the concern expressed in the report of the national review of South African doctoral qualifications (CHE 2022b: 41) that many institutions do not have enough qualified supervisors and that "there is a need for balance between available supervisory capacity and numbers of doctoral students enrolled, but few institutions articulated a strategy or plan to achieve and manage such balance."

The *Supplement to VitalStats 2020* (CHE 2022c) includes a cohort analysis of the 2015 intake of master's and doctoral candidates. This cohort analysis indicates that only 24% of master's candidates graduate in 2 years, 41% graduate within 3 years, and a total of 59% have graduated within 6 years (cumulative totals) from the time of their first registration. The 'norm' of a two-year master's degree seems to be far from the mean average. Similarly, the analysis of the 2015 doctoral candidates shows that 41% graduate in 3 years, 53% in 4 years, 62% in 5 years, and 67% in six years (cumulative totals). The 'norm' of the three-year doctorate is also at odds with the actual mean average.

There is clearly scope to enhance the postgraduate retention and throughput rates, and to attend to the frequently reported student experience of poor supervision and a lonely postgraduate journey (Cloete, Mouton & Sheppard 2015). In order to design postgraduate studies that appropriately meet the needs of the students, it is essential to have a strong sense of who they are.

Who are the postgraduate students in South Africa?

The recent Doctoral Graduate Tracer Study (DSI 2022) suggests that the majority (60%) of doctoral candidates study part-time in South Africa; a statistic that has remained pretty much unchanged in the last two decades. This varies by field with students in science, technology, engineering and mathematics (STEM) fields of study being more likely to study full-time and being more likely to be funded. The high percentage of part-time postgraduate students has significant pedagogical implications. It cannot be assumed that these students will forge their own support networks within the student body or connect with others in their field through informal on-campus exchanges. Instead, opportunities for such communities of practice need to be actively curriculated.

The report of the Doctoral Graduate Tracer Study (DSI 2022) further indicates that 33% of doctoral candidates are self-financing, 30% are financially supported by the universities that employ them, only 22% receive funding from South African funding agencies (such as the National Research Foundation), 8% rely on international funding agencies, and 6% receive funding from an employing organisation that was not a university. The issue of funding is repeatedly indicated in the literature to be the main reason for lack of completion of postgraduate studies. Alongside reflections, such as this *Briefly Speaking*, about how models of supervision and the nurturing of a research-rich culture can enhance postgraduate retention, it is critical to urgently focus on

increasing the funds available for postgraduate studies.

Understanding who the postgraduate students are in South Africa is vital to creating the appropriate spaces for postgraduate education. Typically, there are few spaces in the academy to reflect on the structure of the curriculum and the pedagogical approaches used at postgraduate level, especially the doctorate. While curriculum renewal, student evaluation, and quality assurance are a regular characteristic of undergraduate programmes (and honours and coursework master's programmes), they are less common at the higher levels of study. This allows the status quo to remain largely unchallenged. A consideration of who the postgraduate scholars are, which is offered only in the broadest of brushstrokes herein, should be central to decisions about the model of supervision to be selected. It is to these models that this article now turn.

The One-on-One model and Co-supervision

The one-on-one model comprises an individual student and supervisor who work together over several years while the student undertakes their study. The one-on-one model is also known by various other names including the 'Oxbridge model', the 'master-apprentice model', and the 'tutorship' model (Zeegers & Barron 2012; Kiley 2017; Dominguez-Whitehead & Maringe 2020; Carter-Veale et al. 2016). In this model, the student develops a proposal for a research project on a specific topic which is usually considered by a Higher Degrees Committee of a higher education institution, sometimes after a presentation by the student, and often alongside an application for ethical clearance to undertake the study. There are often no further expectations around presentations or submissions outside of those negotiated between the supervisor and student. There is thus the possibility that the only people, apart from the supervisor, to engage with the student's work after the proposal has been approved, are the examiners. This constitutes a quality risk as there is the possibility that the student and supervisor miss a fundamental problem with the study which is only identified in the high-stakes examination.

The main concern about the one-on-one model is the enormous burden it places on the supervisor because it is up to the supervisor to ensure that the student understands the expectations of postgraduate study and implements them timeously. The responsibility for supporting and guiding the student and assuring the quality of the study rests with the supervisor. If the supervisor is insufficiently versed in the field or the methodological approach, if the supervisor is ill-equipped to develop the student's academic writing, or if the supervisor is absent or tardy in providing feedback, the research project can easily become compromised.

Most significantly, the literature notes that if there is poor supervision in this model, it takes place behind closed doors and is thus unlikely to come to the attention of the institution. The power relations embedded in this model often make it challenging for the student to seek assistance

outside of the supervisory relationship. Any toxic power relations are allowed to fester because the model assumes that the supervisor has sufficient expertise, capacity and compassion to support the student and their project (Hunt and Swallow 2014; Paul, Olson, & Gul 2014). The model arguably positions the student as needing to be under the 'watchful eye of the master' (Zeegers and Barron 2012: 21), which can make them particularly susceptible to poor supervision.

In many cases, the one-on-one model is extended to include co-supervision, whereby an additional supervisor is appointed. This can occur for various reasons, for example to provide expertise that the main supervisor lacks on a specific aspect of the study such as the methods or context, or to allow for the mentorship of novice supervisors prior to their supervising on their own (Ngulube and Ukwoma 2019). Co-supervision can arguably temper the power relations embedded in the one-on-one model, though it can also exacerbate them if supervisors engage in academic one-upmanship at the expense of the student.

Over a number of years, the dominance of the one-on-one approach in South Africa has been implicated in poor retention and throughput (CHE/CREST 2009; ASSAf 2010; Cloete, Mouton & Sheppard 2015). The model is particularly dominant in the Humanities and Social Sciences, such as Education, Commerce, and Law. In part, this is because such fields of study usually see students undertaking research on very specific topics and using very specific methods that are less easily translated into the team approaches common in the laboratory and fieldwork settings of many fields in the Natural Sciences.

The report on the national review of the South African doctoral qualifications (CHE 2022b: 43) notes that:

… the apprenticeship model can lead to challenges in terms of power dynamics between supervisor and student, which can be exacerbated by differences in background or culture. This is also recognised widely as a disadvantage and calls for consideration of alternative models for supervision.

The report goes on to note that other models are beginning to be found across fields in South Africa and this is:

generally viewed as a valuable approach, especially where the doctoral studies are in inter-/multi-/transdisciplinary knowledge areas… An additional innovation is the introduction of peer support networks, and some universities are supporting peer group student communities of practice. These may be considered good practices, to be recommended.

(CHE 2022b: 44).

Other models of supervision

Across the world, there has been a significant move towards more collaborative and structured approaches of postgraduate supervision. A scoping review of the literature on models of doctoral supervision between 2020 to 2022

(McKenna & Van Schalkwyk 2023) found that such shifts were evident:

in various countries in Western Europe (Keller et al. 2018; Baschung 2016; Ramírez 2016), Canada (Paul, Olson, and Gul 2014), New Zealand and Australia (Sampson and Comer 2010; McCallin and Nayar 2012); Russia (Maloshonok and Terentev 2019); China (Zhu, Cai, and François 2017), Brazil (Bursztyn 2016), Nigeria (Ngulube and Ukwoma 2019), Mauritius (Samuel and Mariaye 2014), South Africa (Samuel and Vithal 2011), and elsewhere.

The move to more collaborative and structured models has been driven by increases in student numbers and by demands for greater efficiency. Skopek, Triventi, and Blossfeld (2022) report on an impressive increase in both retention and throughput with the introduction of more collaborative and structured approaches.

The nature of these models varies considerably but all have in common that students are expected to participate in various activities in group settings, and to meet explicit milestones during their studies. One such model is the cohort model, where each year's intake in a department or faculty function as a class and meet as a collective for seminars and student presentations throughout their studies. Another model is the use of a supervision panel or committee, whereby the student has a main supervisor with whom they engage on a regular basis, and they also have a committee of an additional three or four supervisors to whom they present their work on a quarterly or bi-annual basis.

In many European universities, postgraduate students register in a doctoral school or postgraduate school, and are expected to participate in various activities within that structure, as well as in those activities required in their departments. Another common model is that of the project team. This model is often funded and is often multidisciplinary. In the project team approach students apply to be part of the larger project led by a team of supervisors and each candidate investigates a specified aspect of a larger problem area. In many cases, the team includes both master's and doctoral candidates. This project team approach in many ways mimics that found in the Natural Sciences and borrows many of the practices associated with postgraduate education in those fields.

The most significant aspect of all these models is that they have opportunities built into them for students to acquire methodological expertise, to come to understand debates in their field beyond their specific topic, and offers ample opportunities for students to present their work-in-progress. The models include opportunities for postgraduate scholars to foster a network of peers and to receive feedback from multiple sources alongside the feedback they may obtain from their main supervisors.

As with co-supervision, these models entail students having to navigate receiving feedback that may at times be conflicting. But the public

nature of many of the deliberations about the student's work and progress ideally provides space for students to decide on which advice to follow, which to reject, and how to build a case for such rejection.

Increased structure in postgraduate education

The increased structure of the models outlined above often also entails the inclusion of coursework. While the use of coursework is often known in the literature as 'the American model' (Ngulube and Ukwoma 2019; Maloshonok and Terentev 2019), the scoping review by McKenna and Van Schalkwyk (2023) suggests it has now become widespread. The HEQSF (2013) indicates that in South Africa, no coursework can count for credits at doctoral level, making the inclusion of coursework relatively rare. The literature in favour of coursework at postgraduate level argues that it ensures that students acquire a broad range of skills and knowledge that extend beyond the very narrow specialisation on their topic. This is seen to be increasingly important as students undertake doctoral studies for purposes beyond academic careers. Coursework is also seen to be useful for multidisciplinary teams where students (and supervisors) may bring expertise from one field but now need to be able to draw from understandings across multiple fields.

Arguments against coursework are that it can prove to be a distraction from the main research project and take up precious time needed for knowledge creation. In cases where the coursework is offered at faculty or institutional level, it is often seen to be too generic and unrelated to the specific knowledge creation norms of the field. Furthermore, there is seen to be a challenge for many students in moving from the coursework aspects of their study to the thesis portion if the two parts are insufficiently coherent and the transition insufficiently scaffolded.

Another frequent feature in many of these other models of postgraduate education around the world is the use of progress milestones and examinations, though this is not yet common in South African universities. In many countries, students are required to undertake an examination (or submit a few chapters of their work for assessment) at the mid-way point of their studies before being permitted to continue. In some cases, students can exit a doctoral programme with a master's degree if they have completed various requirements of their study but are ABD (All but dissertation). In South Africa, however, the HEQSF makes clear that no early exit qualification is permitted from either a master's or doctoral enrolment.

It is arguably challenging for supervisors in South Africa to implement milestone expectations, coursework, or presentation and seminar attendance requirements given that these are not the norm in most universities. An additional, though not insurmountable challenge is that most postgraduate students in South Africa study part-time. Given the affordances of online learning, most of these initiatives can be readily re-created online.

The demand for a more international postgraduate experience was seen to be another driving force behind shifts towards such models (Zhu, Cai, and François 2017; Baschung 2016), and there was evidence in the literature that these more structured and collaborative models are often also associated with opportunities such as joint doctorate degrees, study-abroad semesters, and workplace projects as part of the programme (Østern 2016; Prøitz and Wittek 2019). Attendance at conferences and support to publish from their research are also a common aspect built into these models of supervision. Many of these opportunities are curriculated into the programme in ways that would be a challenge to achieve in the one-on-one model of supervision. These models have also been shown to be more sustainable because they can withstand the departure of a supervisor or the inclusion of new staff members more readily (Lachmann et al. 2020; Guerin and Green 2015).

There are some concerns that cohort, panel, project team and other such collaborative models are more labour-intensive as they require supervisors and students to work together and often to be together in seminars and in-progress presentations and so on. However, others have argued that more structured, collaborative approaches are less work-intensive than the one-on-one or co-supervision models where supervisors must repeat issues to each student they supervise and where there are few opportunities for students to learn from peers and other supervisors. Manabe et al. (2018) suggest that the urgent need for research capacity in the global south make the one-on-one model particularly inappropriate in the context of sub-Saharan Africa.

In all cases, the insertion of more collaboration and more structure into postgraduate education was seen to contribute to a research-rich culture, but it should not be taken for granted that the implementation of the structure alone will achieve this.

The need for a research-rich culture

Much of the literature on models of postgraduate education make claims about the benefits of the different models. However, the model alone is unlikely to fully account for differences in the experience of students and to fully address issues of retention and throughput. It is likely that a key to any success is the culture of research that such models foster. The claims in the literature pertain to students having a sense of belonging, having space to learn from others, having a network in which to tackle problems related to their studies or supervision experiences, and having a clear sense of the expectations of them and the target milestones they should reach along the way. Postgraduate education that happens in teams or cohorts are more likely to have such opportunities built into the programme, but it is not impossible for this to be achieved alongside the one-on-one or co-supervision approaches.

On the one hand, one-on-one and co-supervision models can be augmented to ensure that students are part of a larger community, and they get to engage in research conversations beyond those

with their supervisors. Where such augmentations are formally curriculated and departmental expectations around participation are clear, they can be particularly powerful means of addressing any of the shortcomings of the one-on-one or co-supervision models while retaining the benefits. Indeed, many universities now have centres for postgraduate study which offer workshops, short courses, writing retreats and the like to nurture collaborative spaces for postgraduates. Many departments have put in place seminar series and schedules of regular student presentations. Such initiatives augment the one-on-one or co-supervision models and can bring many of the benefits identified in more collaborative models. However, where such initiatives are ad hoc and not widely supported by supervisors across an academic department or institution, they are unlikely to have the extensive uptake and credibility needed to temper the problems identified with the one-on-one or co-supervision models.

On the other hand, structured and collaborative models can be implemented in highly problematic ways whereby hierarchies are reinforced, group think (especially around theory and method) becomes the norm, and students can bear the brunt of petty political battles. For such models to achieve their promise, they need to be constructed with an explicitly articulated ethos of care, collaboration, and commitment to the research endeavour. They also need to have a designated coordinator so that initiatives such as in-progress presentations are properly scheduled and communicated. If the collaborative model, within which numerous supervisors participate, is left to be collectively coordinated, it is very possible for it to 'fall between the cracks' alongside other formally timetabled responsibilities such as undergraduate teaching and assessment.

In the diagram below (Figure 1), a more nuanced picture is presented that illustrates that with

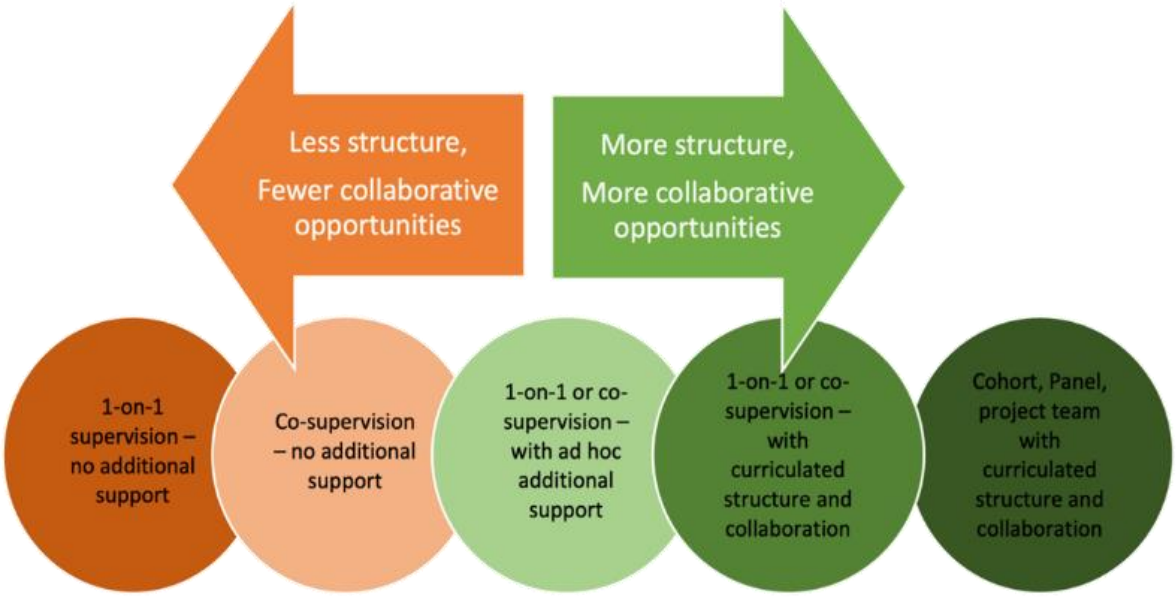

Figure 1 : From Lonely Scholar to Research Team

curriculated support initiatives, the one-on-one and co-supervision models can be appropriate.

This is important to note because any attempt to impose collaborative models as a mandated one-size-fits-all approach in an institution will undoubtedly exclude some highly productive supervisors and may exclude some students seeking to undertake research on a very specific, individual topic or to use a particularly unusual methodology which does not readily fit within a team approach.

While the literature is extremely positive about the benefits for both postgraduate scholars and supervisors of the more structured and collaborative approaches, some cautions are also raised. In particular, it is noted that power imbalances do not simply disappear in project teams and that a sustained effort is needed from the team leader to set up a culture of respect for each other and for the integrity of the research. This includes respect within the team of supervisors, some of whom may be far more experienced than others. Having clearly articulated terms of engagement, especially around giving feedback, is key to making the communal spaces focused on growth and the modelling of strong scientific practices, rather than places where academic egos take over.

There is a need for explicit discussion about how to manage differing viewpoints and feedback. The contested nature of knowledge creation becomes a topic for deliberation in such approaches so that students see such contestation as necessary, productive, and part of collegial peer-review, rather than as confusing contradictions. In many ways, this is another advantage of the collaborative approaches in that students are better prepared for the peer-review processes of conferences, publication, and other forms of knowledge dissemination.

Another key consideration is the extent to which postgraduate education develops the person alongside the knowledge being produced. The HEQSF indicates that a master's candidate needs to "contribute to the development of knowledge at an advanced level" (CHE 2013: 36) and the doctoral candidate needs to "make a significant and original academic contribution at the frontiers of a discipline or field" (CHE 2013: 40). But the focus at postgraduate level is not only on the knowledge product; it is just as important to be developing expert knowers who can go on to make further contributions after they have graduated. The National Doctoral Standard (CHE 2018) lists the graduate attributes that should be in evidence in those who attain the title of Doctor. The extent to which these are developed in the educational process was however questioned in the recent doctoral review (CHE 2022b). Ensuring that postgraduate scholars present their work on regular occasions, provide their peers with feedback, participate in seminars, and meet various milestones along the way, can go some way to more explicitly nurturing the target graduate attributes.

Building a research environment

While some models of postgraduate supervision have collaborative structured environments curriculated into them, they will not automatically achieve their potential if implemented in problematic ways. Conversely, while the one-on-one and co-supervision models have the potential to lead to the 'lonely scholar' approach to postgraduate education, they do not necessarily do this. What is key to successful postgraduate education, is the exposure to a research-rich environment.

Under apartheid, many institutions were prevented from nurturing such environments through restrictions on postgraduate programmes, constraints of academics undertaking research, and the absence of academic freedom. When the new funding formula was implemented as from 2004, all universities were treated equally, with significant reward for postgraduate offerings albeit with limited recognition of the uneven playing fields on which they were doing so. It is in this context that it is important to build the research-rich environments which are vital to postgraduate education. This *Briefly Speaking* ends with a few practical examples of how to nurture such a context.

Faculties and departments need to more explicitly look for synergies between the research undertaken by their academics in order to consider means of implementing shared support structures. This requires research seminars and the like, which can be attended by postgraduate studies as well as departmental academics.

There are enormous benefits for emerging researchers and postgraduate scholars to be in an institution where research seminars and public lectures are the norm. Such events require research divisions that can make suitable arrangements of, and marketing the events offered on campus and online. If emerging researchers, including postgraduate scholars, do not find such opportunities around them, they will find the process of establishing their research capabilities far more challenging.

In some institutions, the discourse around research pertains to output metrics and incentives paid to academics. This greatly undermines the nurturing of passion for research and commitment to postgraduate student mentorship. In such institutions there is a challenge for departments committed to establishing a research-rich culture having to actively work against the discourses that dominate in the wider institution.

The institutional ethos works in parallel with the culture of departmental meetings and staff rooms. If departmental meetings are places of posturing and where hierarchy dictates who may speak, how they may speak, and how they will be listened to, then it is unlikely that the focus on collaborative knowledge creation will prevail. The role of the head of department in forging a research-rich culture cannot be underestimated.

There are many small-scale initiatives that can be put in place to nurture a research-rich

environment. Establishing reading clubs and writing groups for staff and students is just one means of building networks of support for knowledge creation. Scheduling regular in-progress presentations is another. Ideally, academics in the department would not only attend such sessions but would on occasion present their own work, thereby modelling both the passion and the vulnerability associated with such opportunities.

Increasingly institutions are offering supervision training for staff to learn how best to interact with their students and to build research-rich environments. Such staff development opportunities can also serve as spaces for departments to reflect on the culture they are creating for their postgraduate students.

Conclusion

The 'lonely scholar' approach to postgraduate education has been implicated in poor retention and throughput. Over the last two decades, there has been a worldwide shift away from the one-on-one and co-supervision models to ensuring that there are more opportunities for collaboration and a clearer structure of support for postgraduate scholars. In most cases this shift has been to project, cohort, and panel approaches, though where the one-on-one and co-supervision models remain, they are increasingly augmented with curriculated initiatives at a departmental, faculty, or institutional level.

Postgraduate studies require students to come to understand the knowledge creation norms and debates of a field, or to work across and between fields in transdisciplinary settings. It requires them to not only create knowledge but also to take on the graduate attributes of researchers. This is often experienced as an identity journey as much as an intellectual one. It is an enormous burden to expect the supervisor alone to manage all aspects of this complex process. Much rests on the institutional culture and wider research environment in which students interact. Universities are increasingly seeking opportunities for students and staff to share their work and to support each other in the process.

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Disclaimer and acknowledgements

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It is acknowledged with sincere gratitude that this specific issue of *Briefly Speaking* was researched and drafted by Prof Sioux McKenna. The CHE also expresses its profound appreciation to the peer reviewers who contributed immensely to shaping this specific issue of *Briefly Speaking*.

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