



From Scaffolding to Autonomy

A Theoretical Analysis of Postgraduate Supervision
through Self-Determination and Zone of Proximal Development
Theories

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Keywords

Postgraduate supervision, self-determination theory, zone of proximal development, postgraduate productivity, graduation outcomes, management and ethics in higher education.

Abstract

Postgraduate supervision is a critical determinant of research productivity. In South Africa, persistent challenges, including extended time-to-degree, uneven postgraduate throughput, and variable supervision quality, continue to undermine the contribution of postgraduate education to national development and research capacity. The study is theoretically grounded in Vygotsky's Zone of Proximal Development (ZPD) and Self-Determination Theory (SDT), which together provide a complementary developmental and motivational lens for analysing postgraduate supervision. The Zone of Proximal Development explains how scaffolded academic support enables students to perform beyond their current capabilities. At the same time, Self-Determination Theory elucidates how the fulfilment of autonomy, competence, and relatedness sustains motivation and persistence. Using a conceptual research design, the study conducted a systematic and integrative review of 68 peer-reviewed scholarly sources published between 2015 and 2024, sourced primarily from Google Scholar and Scopus-indexed journals. The study proposes a conceptual framework that positions supervision as a developmental continuum, beginning with intensive, ZPD-informed scaffolding and progressively shifting towards autonomy-supportive supervision as students' research competence increases. The framework illustrates how adaptive supervisory practices mediate motivation and learning, enabling postgraduate students to develop confidence, independence, and a strong scholarly identity. This study reconceptualises postgraduate supervision by integrating developmental learning theory and motivational psychology. It argues that supervision progressing from scaffolding to autonomy strengthens postgraduate education and research capacity in South African higher education institutions.

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1. Introduction and Background

Postgraduate education remains a strategic priority for higher education systems worldwide, particularly in the knowledge economy, where advanced research skills, innovation capacity, and doctoral-level expertise are increasingly essential (OECD 2021). In South Africa, postgraduate education plays a crucial role in addressing national development priorities, enhancing research output, and promoting transformation in historically disadvantaged institutions (Department of Higher Education and Training [DHET], 2020). Despite sustained growth in postgraduate enrolments, concerns persist regarding low completion rates, prolonged time-to-degree, and uneven research productivity across universities (CHE 2022).

Recent studies consistently identify postgraduate supervision as one of the most significant determinants of postgraduate success, productivity, and timely graduation (Huet and Casanova, 2022; Crofford et al. 2025). Adequate supervision is now understood as a complex pedagogical and relational practice that extends beyond technical research guidance to include motivational support, academic socialisation, emotional intelligence, and the deliberate development of scholarly independence (Bastalich, 2017; Ofem et al, 2025). However, supervision practices in many universities remain uneven and highly individualised, often lacking a coherent theoretical foundation to guide supervisory decision-making (Kumar and Bolliger, 2025).

Many postgraduate students require structured academic support, particularly in the early stages of candidature. However, excessive supervisory control may foster dependency, while insufficient guidance can leave students academically isolated and at risk of delayed completion or attrition (Crofford et al. 2025). This tension highlights the need for supervision approaches that balance developmental support with the cultivation of autonomy.

Similarly, Vygotsky's Zone of Proximal Development (ZPD) remains highly relevant in contemporary supervision discourse, particularly in relation to scaffolding and developmental progression (Shabani et al. 2019). ZPD emphasises that learning is optimised when supervisors provide structured, responsive support that is gradually withdrawn as competence develops.

When applied to postgraduate supervision, ZPD offers a conceptual basis for aligning supervisory input with students’ evolving research capabilities, thereby facilitating the transition from guided learning to independent scholarship.

Introduction

Postgraduate supervision has become a focal concern in higher education due to increasing institutional pressure to improve research outputs, enhance throughput, and reduce time-to-degree. Universities are expected not only to enrol postgraduate students but also to ensure their timely graduation and effective integration into scholarly and professional communities (OECD, 2021). In South Africa, these expectations are reinforced by funding frameworks and performance indicators that link postgraduate completions and research productivity to institutional sustainability and national development goals (DHET, 2020; CHE, 2022). However, postgraduate completion rates remain inconsistent, with many students experiencing extended candidature periods or failing to complete their studies.

Recent research highlights that the quality of supervision plays a crucial role in shaping the motivation, engagement, and academic progress of postgraduate students (Huet & Casanova, 2022; Ofem et al, 2025). Adaptive guidance, negotiated expectations, timely feedback, and the intentional development of independence increasingly characterise adequate supervision. Nonetheless, many supervision practices remain rooted in traditional master–apprentice models that may not adequately respond to the diverse needs of contemporary postgraduate cohorts (Kumar & Bolliger, 2025). The absence of explicit theoretical grounding often results in inconsistent supervision practices that undermine student productivity and delay graduation.

This study addresses this gap by providing a theoretical analysis of postgraduate supervision through the integrated lenses of Self-Determination Theory (SDT) and the (ZPD). Conceptually, the study positions postgraduate supervision as a developmental continuum that moves deliberately from scaffolding to autonomy. Drawing on Self-Determination Theory, the study

argues that postgraduate productivity and graduation outcomes are enhanced when supervision practices actively support student autonomy, foster research competence, and nurture constructive relationships between supervisors and students (Ryan & Deci, 2020). Motivation, persistence, and research engagement are strengthened when students experience ownership of their research and confidence in their scholarly abilities (Jeno et al., 2018).

At the same time, the ZPD offers a complementary developmental lens, explaining how supervisors can calibrate the level of academic support they provide. Scaffolding within the ZPD enables students to acquire complex research skills through guided practice, feedback, and modelling, with supervisory support gradually withdrawn as independence increases (Shabani et al., 2019). This balance is particularly critical in South African universities, where postgraduate students often enter with varying levels of research preparedness and differing exposure to academic research cultures (Kreber, 2023).

The aim of this study is therefore to enhance postgraduate productivity and graduation outcomes in South African universities by advancing a theoretically grounded understanding of adequate supervision. By integrating SDT and the ZPD, the study contributes to contemporary debates on postgraduate supervision. It offers a developmental framework that can inform supervisory practice, academic staff development, and institutional policy. Ultimately, the study argues that supervision which intentionally transitions from structured scaffolding to autonomous scholarly engagement is essential for producing competent, motivated, and independent postgraduate graduates.

Problem Statement

Globally, postgraduate education is widely recognised as a critical driver of research productivity, innovation, and human capital development in higher education institutions. In South Africa, postgraduate training is a central component of national priorities, including transformation, skills development, and strengthening the country's research and innovation system (Department of Higher Education and Training [DHET] 2020). Despite

sustained growth in postgraduate enrolments, South African universities continue to face persistent challenges, including low completion rates, extended time-to-degree, and uneven postgraduate research productivity across institutions and disciplines (Namakula and Ndaba 2024; Council on Higher Education [CHE] 2022). These challenges undermine institutional performance, strain supervisory capacity, and weaken the overall contribution of postgraduate education to national development goals.

A growing body of contemporary research identifies the quality of postgraduate supervision as one of the most significant determinants of postgraduate productivity and graduation outcomes (Crofford et al. 2025). While supervision is expected to provide intellectual guidance, methodological support, and academic socialisation, many postgraduate students report unclear expectations, inconsistent feedback, inadequate developmental support, and limited opportunities to cultivate independent research competence (Ofem et al. 2025). In such contexts, supervision often becomes reactive and compliance-driven rather than developmental and pedagogically informed, which can contribute to delayed progress and non-completion.

Kreber (2023) emphasised that the postgraduate environment in South Africa exacerbates this issue due to considerable differences in students' academic readiness, prior research exposure, and the availability of institutional resources, including access to research funding, digital infrastructure, academic writing support, library databases, research software, experienced supervisors, and postgraduate development programmes. Many postgraduate students require structured academic scaffolding, particularly in the early stages of candidature. However, overly directive supervision can foster dependency and inhibit the development of autonomy, while insufficient or poorly timed support may leave students academically isolated and vulnerable to attrition (Crofford et al 2025). This tension highlights a fundamental problem in postgraduate supervision: how to balance structured support with the intentional development of independent scholarly capability.

Although theoretical perspectives such as SDT and the ZPD offer robust explanations for motivation, learning, and developmental progression, their

systematic application to postgraduate supervision remains limited in the South African higher education context. SDT emphasises autonomy, competence, and relatedness as key drivers of sustained motivation and performance (Ryan and Deci 2020), while the ZPD underscores the importance of calibrated scaffolding that is gradually withdrawn as competence develops (Shabani, Khatib and Ebadi 2019). The absence of theoretically grounded supervision frameworks that integrate these perspectives contributes to inconsistent supervisory practices and limits the effectiveness of interventions to improve postgraduate productivity and graduation rates.

The core problem addressed by this study, therefore, is the lack of a coherent, theory-driven understanding of postgraduate supervision that deliberately supports the transition from scaffolding to autonomy. Without such an approach, postgraduate students in South African universities remain at risk of delayed completion, reduced research productivity, and diminished academic confidence. This study seeks to address this gap by providing a theoretical analysis of postgraduate supervision grounded in SDT and the ZPD, to inform supervision practices that enhance postgraduate productivity and graduation outcomes in South African higher education institutions.

2. Aim of the Study

This study aims to enhance postgraduate productivity and graduation outcomes in South African universities by developing a theoretically grounded understanding of adequate supervision. Specifically, the study applies SDT and the ZPD to conceptualise supervision as a developmental process that transitions from structured scaffolding to autonomous scholarly engagement.

Methodology

This study employed a conceptual research design, appropriate for synthesising existing knowledge and building theoretical insights rather than collecting empirical data. Conceptual research is widely recognised as a method for advancing theory and clarifying complex phenomena in higher

education scholarship (Adeniran and Tayo-Ladega 2024). The methodological process began with a systematic examination of academic literature using Google Scholar and Scopus-indexed sources to identify relevant literature on postgraduate supervision, SDT, and ZPD. Postgraduate completion guided the search, resulting in the selection of 68 peer-reviewed journal articles, books, and reports published between 2015 and 2025. This timeframe ensured coverage of the most recent developments in supervision theory and postgraduate education research.

The selected literature was analysed using an integrative and thematic synthesis approach, which is particularly effective for conceptual studies aiming to generate new models or frameworks based on existing evidence (Adeniran and Tayo-Ladega 2024; Juárez 2025). This involved identifying key concepts and theoretical contributions relating to ZPD and SDT, comparing how each has been applied in the context of postgraduate learning, and critically interpreting their intersections. Through iterative review and mapping of the literature, themes of scaffolding, autonomy, motivational support, and developmental progression emerged as central constructs. The synthesis enabled the development of a coherent conceptual model that articulates how postgraduate supervision can move deliberately from structured support to autonomous research engagement. This method ensured theoretical rigour and clarity, grounding the model in current scholarly discourse while offering a meaningful contribution to understanding postgraduate supervision practice.

Postgraduate Productivity and Graduation Challenges in South Africa

In a South African study, Saidi (2024) highlighted that Postgraduate education in South Africa faces challenges that hinder graduation rates and productivity. Improving the quality of supervision is essential for increasing completion rates among postgraduate students. Research indicates that insufficient supervisory support leads to longer graduation times and higher student attrition rates (Mofolo and Lukman 2024). This situation is exacerbated by inadequate supervisory structures present in many universities, which limit students' engagement and hinder their academic

progress (Nxumalo 2025). Consequently, institutions need to establish structured and effective supervisory practices to improve student outcomes and productivity.

Additionally, the administrative burden associated with postgraduate studies represents a substantial hurdle for many students in South Africa. Institutional frameworks often fail to provide the necessary support for students navigating the complexities of thesis and dissertation writing (Aggabao 2025). A study revealed that students often report feelings of isolation and a lack of assistance, which further exacerbates their challenges (Aggabao 2025). Access to research support services, coupled with inadequate training in research methodology, significantly hampers students' ability to complete their degrees promptly (Aggabao 2025). Therefore, addressing these administrative challenges is crucial to improving the overall completion rates of postgraduate programs.

Moreover, the psychosocial environment surrounding postgraduate students in South African universities also contributes to the challenges of graduation. Factors such as mental health issues, stress, and financial instability create barriers to effective learning and completion of studies (Paruk et al. 2023). The COVID-19 pandemic has amplified these issues by adding another layer of uncertainty and disruption, leading to increased psychological distress among students (Paruk et al. 2023). In addition, many students face societal pressures that further hinder their academic performance, necessitating mental health support systems and financial assistance programs to foster a conducive learning environment.

Lastly, addressing deficiencies in educational infrastructure and creating a supportive academic culture is imperative for improving postgraduate productivity in South Africa. Institutions must prioritise the development of a robust research culture characterised by interdisciplinary collaboration and accessible resources. By fostering an environment conducive to learning and innovation, universities can cultivate a generation of graduates better equipped to meet the demands of the workforce (Muasya 2025). Implementing targeted initiatives, such as seminar workshops for skill enhancement and access to databases, can significantly aid in overcoming

existing barriers students face (Aggabao 2025). A collaborative approach that engages faculty, administration, and students will be vital in enhancing the postgraduate educational experience in South Africa.

3. Theoretical Foundations of the Study

This study is grounded in the understanding that postgraduate supervision is both a motivational and developmental process that directly shapes students’ research productivity, persistence, and graduation outcomes. The theoretical foundation draws primarily on SDT and Vygotsky’s ZPD to explain how supervision can effectively support postgraduate students’ academic progression in higher education. These theories are particularly relevant in contemporary university contexts, where postgraduate cohorts are increasingly diverse in terms of academic awareness, socio-economic background, and research experience. Together, SDT and ZPD provide a robust explanatory lens for understanding how supervision practices can foster motivation, competence, and independence, while also offering structured support that is responsive to students’ evolving capabilities (Ryan and Deci 2020; Shabani et al. 2019).

SDT emphasises autonomy, competence, and relatedness as essential psychological needs that underpin sustained motivation and high performance in learning environments. Within postgraduate supervision, SDT emphasises the importance of supervisory practices that foster student ownership of research, develop confidence in scholarly skills, and cultivate supportive supervisor–student relationships. Complementing this motivational perspective, the ZPD focuses on the developmental role of scaffolding, in which supervisors provide targeted guidance that enables students to perform beyond their current level of competence, gradually withdrawing support as students achieve independence. When integrated, SDT and ZPD conceptualise postgraduate supervision as a dynamic progression from guided learning to autonomous scholarship. This theoretical integration is particularly suited to the South African higher education context, where enhancing postgraduate productivity and graduation outcomes

requires supervision models that are both developmentally sensitive and motivation-enhancing.

Self-Determination Theory and Postgraduate Supervision

The SDT, initially formulated by Edward Deci and Richard Ryan in the mid-1970s, provides a vital framework for understanding motivation in educational settings, particularly in the context of postgraduate supervision. The theory posits that human motivation is driven by the fulfilment of three basic psychological needs: autonomy, competence, and relatedness. These needs, when satisfied, not only enhance intrinsic motivation but also improve psychological well-being (Sanguinetti 2023). This foundation has significant implications for postgraduate education, where the supervisory relationship can either facilitate or hinder the fulfilment of these motivational needs, thereby impacting students' academic performance and overall satisfaction.

The fundamental principles of SDT indicate that autonomy relates to the feeling of volition and self-endorsement in one's actions, competence pertains to the sense of effectiveness and skilfulness in a given context, and relatedness concerns the sense of belonging and connection with others (Rasul and Schwaiger 2023). For postgraduate students, particularly in research-intensive environments, the interplay of these components becomes crucial. Effective supervisors need to create an environment that nurtures students' autonomy by providing opportunities for independent thought and decision-making, thereby fostering a sense of ownership over their research projects. Furthermore, by offering constructive feedback and support, supervisors can help students develop their competencies, thus enhancing their confidence and motivation (Mak 2021). When students perceive that their supervisors genuinely care for their success and well-being, it amplifies feelings of relatedness, which can significantly boost their intrinsic motivation to engage with their studies (Rasul and Schwaiger 2023).

Moreover, when SDT is applied to the study of postgraduate supervision, these principles can be directly linked to enhanced academic outcomes. Research indicates that a learning climate that satisfies the psychological needs promotes higher intrinsic motivation among students, which in turn

leads to improved academic performance and greater psychological well-being (Rasul and Schwaiger 2023). For instance, in the context of postgraduate research, students who feel a strong sense of autonomy in deciding their research directions are likely to demonstrate higher levels of engagement, creativity, and commitment to their work. Conversely, if supervisors adopt a more controlling or prescriptive approach, it may inhibit students' intrinsic motivation, potentially leading to adverse outcomes, such as attrition or disengagement (Craig et al. 2023). Thus, adopting an SDT-informed supervisory style is crucial not only for enhancing motivation but also for ensuring that students successfully navigate the challenges inherent to postgraduate studies.

Moreover, incorporating SDT into postgraduate supervision practices can significantly enhance student motivation and academic success. Fostering an environment that emphasises autonomy, competence, and relatedness, supervisors may bolster students' intrinsic motivation, leading to increased satisfaction and improved academic outcomes. Engaging students in their educational journeys and supporting their psychological needs will ultimately cultivate a more productive and fulfilling postgraduate experience, which is paramount for developing capable, autonomous researchers in academia (Murphy et al. 2021). Hence, integrating SDT principles into postgraduate supervision models can be an effective strategy to enhance the educational experience, ultimately benefiting both supervisors and supervisees.

Zone of Proximal Development and Scaffolding in Supervision

The ZPD, a concept introduced by Lev Vygotsky in the early 20th century, is central to understanding the dynamics of learning and development. ZPD refers to the range of abilities that a student can perform with the guidance of a more knowledgeable person but cannot yet manage independently. This theory posits that effective learning occurs within this zone, where learners receive appropriate support, or "scaffolding," from instructors or peers, enabling them to develop new skills and knowledge. Scaffolding involves various instructional techniques, including modelling, questioning, and providing hints or partial answers, which enable students to gradually achieve independence in their learning process (Shareef 2025). In the context of

postgraduate supervision, these concepts illustrate the potential for transforming supervisory practices by fostering deeper engagement and enhancing student competency.

In postgraduate education, the application of ZPD and scaffolding principles can have significant implications for the supervisory relationship between faculty/Department and students. Adequate supervision requires an understanding of each student's individual capabilities and the challenges they face. For instance, methodologies designed to assess students' current proficiency levels can guide supervisors in providing tailored support that promotes independent problem-solving. Such an approach is essential, given that postgraduate students often undertake complex research tasks that require high levels of critical thinking and analytical skills. Leveraging scaffolding techniques aligned with ZPD principles, supervisors can help students bridge the gap between their existing skills and the competencies required to complete their degrees.

Moreover, the interplay of scaffolding and ZPD promotes a collaborative learning environment, fostering greater student engagement and motivation. Research has shown that when supervisors adopt a supportive and interactive approach, students are more likely to develop a sense of self-efficacy and commitment to their work (Akala 2023). This relates closely to Self-Determination Theory (SDT), which emphasises the importance of autonomy and competence in motivating learners. By using scaffolding techniques grounded in ZPD, supervisors can empower their students to take ownership of their research, increasing their intrinsic motivation and likelihood of successful outcomes. For instance, creating opportunities for students to choose their research topics and approaches enhances their autonomy and aligns their educational experiences with their personal interests and goals.

The principles of the ZPD and scaffolding within postgraduate supervision can facilitate a more effective learning environment that actively supports students' growth. Recognising the individual needs and capabilities of students, supervisors can provide tailored guidance, enabling learners to progress towards greater independence and confidence in their academic pursuits. Adopting these strategies can significantly enhance the educational

experience for postgraduate students, ultimately improving graduate outcomes and contributing to the development of skilled researchers who can navigate complex challenges in their fields. The thoughtful application of ZPD and scaffolding principles thus offers a pathway to foster not just academic achievement, but also a vibrant academic culture that prioritises student engagement and success.

4. From Scaffolding to Autonomy: An Integrated Theoretical Perspective

Postgraduate supervision is increasingly conceptualised as a developmental process rather than a static or uniform practice. This study advances an integrated theoretical perspective that combines Vygotsky’s ZPD and SDT to explain how adequate supervision can intentionally progress from structured scaffolding to autonomous scholarly engagement. Together, these theories provide complementary insights into *how* supervisors support postgraduate students’ learning and *why* such support enhances motivation, productivity, and timely graduation. The integration of ZPD and SDT can offer a coherent framework for understanding supervision as a dynamic interaction between developmental support and motivational fulfilment.

The ZPD conceptualises learning as occurring within a space where students can perform complex tasks with guidance that they cannot yet accomplish independently (Vygotsky 1978). In postgraduate supervision, this translates into scaffolding practices such as modelling research processes, providing structured feedback, clarifying expectations, and guiding methodological and theoretical decision-making in line with researchers (Rathilall 2025). Contemporary scholarship emphasises that effective scaffolding is adaptive and responsive, requiring supervisors to continuously assess students’ evolving research competence and adjust their level of support accordingly (Shabani, Khatib and Ebadi 2019; Krebler 2023). When scaffolding is appropriately calibrated, it enables postgraduate students to progressively internalise research skills, critical thinking, and academic norms, thereby moving closer to independent scholarly practice.

However, scaffolding alone is insufficient if it does not transition deliberately toward autonomy. Overly directive or prolonged supervisory control can foster dependency, limit critical engagement, and undermine students' confidence as independent researchers (Van der 2025). This is where SDT provides essential explanatory depth. SDT posits that optimal motivation and sustained performance depend on the satisfaction of three basic psychological needs: autonomy, competence, and relatedness (Ryan and Deci 2020). In the context of postgraduate supervision, autonomy refers to students' sense of ownership and control over their research; competence reflects their confidence in their research abilities; and relatedness denotes the quality of the supervisor–student relationship. Supervision that supports these needs enhances intrinsic motivation, persistence, and research engagement (Jeno, Danielsen and Raaheim 2018).

Combining Self-Determination Theory (SDT) with the Zone of Proximal Development (ZPD) redefines scaffolding. It becomes a temporary strategy to support independence rather than control. Scaffolding builds skills within the ZPD, and SDT shows that more independence increases motivation and self-regulation. As students gain competence through guided practice, supervisors intentionally reduce directive input, encourage independent decision-making, and reposition themselves as critical peers rather than instructional authorities. This transition is essential for postgraduate productivity, as autonomous students are more likely to demonstrate initiative, sustained research engagement, and timely progression toward completion (Ofem et al. 2025).

Within the South African higher education context, this integrated perspective is particularly salient. Postgraduate students often enter programmes with uneven academic preparation and varying exposure to research cultures, necessitating early-stage scaffolding (Bao 2025). At the same time, national imperatives to improve postgraduate throughput and research outputs require supervision practices that cultivate independence rather than prolonged dependency (CHE 2022). Combining ZPD and SDT, this study conceptualises postgraduate supervision as a developmental continuum that begins with structured scaffolding and culminates in the formation of an autonomous scholarly identity. This integrated theoretical

perspective provides a robust foundation for supervision practices that enhance postgraduate productivity, reduce time-to-degree, and improve graduation outcomes in South African universities.

Rooted in Vygotsky's work, the ZPD is defined as the range of tasks that a learner can complete with guidance but cannot yet perform independently. This concept underscores the importance of social interaction in the learning process, particularly in academic settings where novice students often require significant support to navigate complex tasks, such as conducting research or writing dissertations. Scaffolding, closely associated with the ZPD, refers to the educational support provided by more knowledgeable peers, supervisors, or other lecturers to help students achieve higher levels of understanding and skill (Redburn and Hayes 2024; Van Nooijen et al. 2024).

In the context of postgraduate supervision, these concepts work together to provide a structure that promotes student autonomy. Autonomy, as described in SDT, is critical for fostering intrinsic motivation. When supervisors scaffold effectively, they do so to gradually withdraw assistance as students develop their competence. This dynamic is essential in allowing students to become autonomous researchers. As students gain confidence in their abilities, they can begin to undertake tasks independently, transitioning from guided practice to self-sufficiency in their academic pursuits (Guleç 2024 and Uzun 2024). The balance between providing support and encouraging independence is foundational to maximising students' learning potential and ensuring their academic success.

Effective scaffolding requires a nuanced understanding of individual student needs within their ZPDs. Supervisors must tailor their support strategies to reflect the unique strengths and weaknesses of each student. An effective supervisor employs formative assessment techniques to gauge where a student might be struggling and to adjust their scaffolding accordingly (Dwigustini et al. 2022; Schweiker and Levonis 2023). For example, a supervisor might initially provide extensive guidance on methodological approaches and gradually shift toward promoting critical thinking and decision-making as students become more competent. This tailored approach not only supports the development of specific skills but also fosters essential

qualities such as self-efficacy and resilience, which are crucial for navigating the challenges of postgraduate studies. Moreover, integrating ZPD and scaffolding into postgraduate supervision fosters a supportive academic community. When supervisors engage with students in a manner that emphasises collaboration and mutual support, it enhances the overall learning environment. Such an academic culture, where peer interactions are encouraged, can foster shared learning experiences that reinforce students' ability to operate autonomously. Over time, this leads not only to improved individual outcomes but also to a greater sense of belonging within the academic community, which further fosters motivation and engagement in their studies (Redburn and Hayes 2024; Rivas and Albertos 2023). In this vein, the progressive movement from scaffolding to autonomy is not merely an individual journey but a collective endeavour that enriches the institutional culture of learning.

Through understanding the critical role of support and guidance in student development, supervisors can effectively promote independence while fostering a collaborative learning environment. This approach ultimately cultivates not only competent researchers but also confident, motivated individuals prepared to make meaningful contributions to their fields of study.

5. Conceptual Framework for Enhancing Postgraduate Supervision

This study proposes a conceptual framework for enhancing postgraduate supervision that is grounded in the integrated application of SDT and Vygotsky's ZPD. The framework conceptualises postgraduate supervision as a developmental and motivational continuum in which supervisory practices evolve from structured scaffolding to autonomous scholarly engagement. The central premise of the framework is that postgraduate productivity and graduation outcomes are optimised when supervision simultaneously addresses students' developmental learning needs and their intrinsic motivational drivers.

At the core of the framework is supervisory scaffolding, derived from the ZPD, which represents the initial phase of postgraduate supervision. During this phase, supervisors provide targeted academic and research support aligned to students’ current level of competence. This includes clarifying research expectations, guiding problem formulation, modelling research methodologies, offering constructive feedback, and supporting academic writing and ethical research practices. According to ZPD, learning is most effective when support is pitched just beyond the learner’s current ability and adjusted as competence develops (Vygotsky 1978; Shabani, Khatib and Ebadi 2019). In postgraduate supervision, this adaptive scaffolding is critical for students who enter programmes with uneven academic preparation, a common characteristic of the South African higher education context (Kreber 2023).

Embedded within the scaffolding process are the motivational conditions articulated by SDT: autonomy, competence, and relatedness. The framework posits that scaffolding should not be controlling, but rather autonomy-supportive, enabling students to assume ownership of their research gradually. As supervisors provide guidance, they simultaneously foster competence by building students’ confidence in their research skills, promote relatedness through supportive and respectful supervisory relationships, and encourage autonomy by allowing independent decision-making (Ryan and Deci 2020). When these psychological needs are satisfied, postgraduate students are more likely to demonstrate sustained motivation, persistence, and engagement with their research tasks (Jeno, Danielsen and Raaheim, 2018).

As students’ research competence increases, the framework emphasises a deliberate reduction of scaffolding, marking the transition from guided learning to independent scholarship. Supervisors shift roles from directive instructors to critical peers and mentors, providing high-level intellectual engagement rather than procedural guidance. This transition is a defining feature of the framework, as prolonged or misaligned supervision can inhibit autonomy and create dependency, negatively affecting productivity and time-to-degree (Crofford et al 2025). In contrast, supervision that intentionally withdraws support at appropriate stages enhances self-regulation, critical thinking, and the formation of a scholarly identity.

The framework further links this developmental progression to key postgraduate outcomes, including increased research productivity, timely completion, and successful graduation. In the South African context, where national policy frameworks emphasise postgraduate throughput and research productivity, this conceptual model provides a theoretically grounded basis for improving supervisory practice and academic staff development initiatives (Council on Higher Education 2022; DHET 2020).

Moreover, the proposed conceptual framework positions effective postgraduate supervision as an intentional, theory-driven process that strikes a balance between support and independence. Integrating Self-Determination Theory and the Zone of Proximal Development, the framework offers higher education institutions a coherent lens for enhancing supervision practices that respond to student diversity, promote intrinsic motivation, and ultimately improve postgraduate productivity and graduation outcomes.

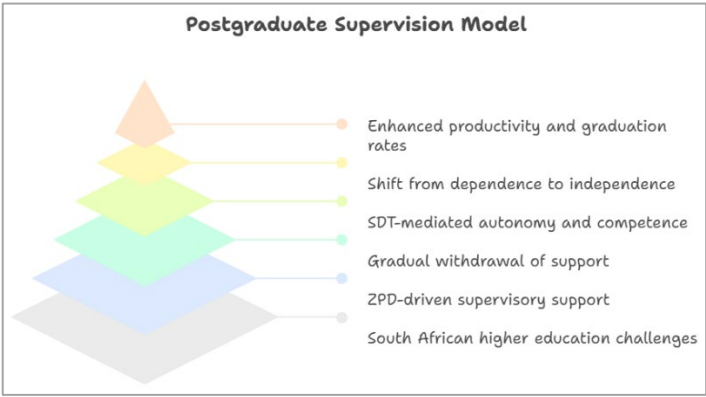


Figure: Conceptual Model of Postgraduate Supervision from Scaffolding to Autonomy

The Postgraduate Supervision Model illustrates a layered and developmental approach to postgraduate supervision, grounded in Vygotsky’s ZPD and SDT. The model is structured from the base to the apex, indicating a progressive movement from contextual constraints and intensive supervisory support towards student autonomy, productivity, and successful graduation. Each layer represents a critical stage in the supervision process, emphasising

that adequate postgraduate supervision is not static but evolves as students’ competence and independence grow.

The model is built on the challenges faced by higher education in South Africa, including resource constraints, significant supervisory burdens, and systemic demands to enhance student success rates. Built upon this foundation is ZPD-driven supervisory support, which reflects the initial phase of postgraduate supervision, in which structured guidance, modelling, and close academic support are essential. As students develop research competence, supervisors gradually withdraw support, carefully reducing directive intervention while encouraging independent thinking and problem-solving. As students cultivate their research competencies, supervisors gradually reduce their level of support, thereby fostering independent thinking and problem-solving skills. This approach is in line with the ZPD principle, which asserts that optimal learning occurs when support is tailored and systematically diminished as learners achieve mastery. Mental progression aligns with the ZPD principle that learning is optimised when support is responsive and progressively reduced as learners gain mastery.

The upper layers of the model are informed by SDT, which highlights the central role of autonomy and competence in sustaining motivation and academic engagement. As supervisory support is withdrawn, students transition from dependence to independence, assuming ownership of their research and developing a strong scholarly identity. The apex of the model represents the ultimate outcomes of adequate supervision: enhanced postgraduate productivity and improved graduation rates. Overall, the model demonstrates that when supervision strategically integrates developmental scaffolding with motivational support, postgraduate students are more likely to progress efficiently, complete their studies on time, and emerge as independent scholars capable of making meaningful contributions to the higher education and research landscape.

6. Implications for Postgraduate Supervision Practice in South African Universities

The conceptual model developed in this study has significant implications for postgraduate supervision practice in South African universities, particularly for enhancing research productivity, reducing time-to-degree, and improving graduation outcomes. First, the model emphasises the importance of supervisors adopting a developmental, differentiated approach to supervision rather than a one-size-fits-all approach. Given the diverse academic backgrounds and varying levels of research awareness among postgraduate students in South Africa, supervisors should intentionally align their level of support with students' evolving competencies. Early-stage postgraduate students may require intensive ZPD-driven scaffolding, including structured guidance, explicit expectations, and close feedback. In contrast, advanced-stage students benefit more from autonomy-supportive supervision that promotes independent decision-making and critical engagement.

Second, SDT highlights the importance of autonomy-supportive supervisory practices in sustaining postgraduate motivation and persistence. Supervisors should create environments that foster student ownership of research projects, encourage intellectual risk-taking, and recognise students as emerging scholars rather than passive recipients of instruction. Practical strategies include negotiated research plans, shared decision-making regarding methodological choices, and reflective supervision meetings focused on skill development and scholarly growth. Such practices strengthen students' sense of competence and relatedness, which are essential for sustained engagement, particularly in contexts where postgraduate students face financial, professional, and personal pressures alongside their studies.

In line with Maistry (2022), the model suggests that institutions should move beyond viewing supervision as an individual responsibility and instead support it as a professional pedagogical practice. This has implications for academic staff development, workload allocation, and policy formulation. Universities should invest in structured supervisor training programmes grounded in developmental and motivational theories, provide clear

institutional guidelines for progressive supervision, and recognise adequate supervision in performance and promotion criteria. By embedding theory-informed supervision practices within institutional cultures, South African universities can better support both supervisors and students, ultimately enhancing postgraduate productivity, improving graduation rates, and strengthening the overall quality of postgraduate education.

Implications for Policy and Academic Staff Development

The conceptual model presented in this study has significant implications for higher education policy and academic staff development in South African universities. At the policy level, the findings suggest a need to reconceptualise postgraduate supervision as a strategic and pedagogical function rather than an informal or purely individual academic responsibility. Institutional and national policies should explicitly articulate expectations for developmental supervision that progress from structured scaffolding to student autonomy. This includes embedding theory-informed supervision principles, particularly those derived from SDT and the ZPD, into postgraduate supervision guidelines, quality assurance frameworks, and performance indicators aligned with national throughput and research productivity targets.

Furthermore, the model emphasises the importance of institutional policies that foster an environment conducive to adequate supervision. This includes realistic workload models, recognition of supervision excellence in promotion and reward systems, and the provision of academic support structures such as writing centres, research methods support, and postgraduate peer communities. Through aligning policy frameworks with structured academic staff development initiatives, South African universities can strengthen supervisory capacity, enhance postgraduate productivity and graduation outcomes, and contribute more effectively to national goals of research development and human capital formation.

7. Contribution of the Study to Higher Education Scholarship

This study contributes to higher education scholarship by advancing a theoretically integrated understanding of postgraduate supervision that bridges developmental and motivational perspectives. By synthesising SDT and the ZPD, the study moves beyond fragmented or practice-based accounts of supervision to offer a coherent conceptual framework that explains how supervision can intentionally transition from scaffolding to autonomy. Like in the study of Machingura, Francis and Shamiso (2026), the study enriches the literature by positioning postgraduate supervision as a dynamic pedagogical process that simultaneously supports competence development and intrinsic motivation, particularly within the under-researched context of South African higher education. In doing so, it provides a theoretically grounded lens for analysing supervision practices, informs future empirical research on postgraduate productivity and graduation outcomes, and offers transferable insights for higher education systems facing similar challenges globally.

8. Conclusion

This conceptual study set out to advance a theoretically grounded understanding of postgraduate supervision by integrating SDT and Vygotsky's ZPD to explain how supervision can intentionally progress from structured scaffolding to autonomous scholarly engagement. The analysis has demonstrated that postgraduate supervision is not a static or uniform activity, but a developmental and motivational process that must evolve in response to students' growing research competence and independence. By framing supervision as a continuum, the study highlights the importance of aligning supervisory support with students' developmental needs while simultaneously nurturing autonomy, competence, and relatedness.

The study further underscores that many of the challenges affecting postgraduate productivity and graduation outcomes in South African universities, such as delayed completion, uneven research preparedness, and

student dependency, can be traced to supervision practices that lack theoretical coherence. By integrating SDT and ZPD, this study provides a coherent conceptual framework that explains how effective scaffolding, when applied in an autonomy-supportive manner, can enhance motivation, sustain engagement, and facilitate the transition to independent scholarship. This theoretical synthesis offers a meaningful contribution to postgraduate supervision scholarship by bridging developmental learning theory and motivational psychology within a higher education context.

In conclusion, the study argues that enhancing postgraduate productivity and graduation outcomes requires intentional, adaptive, and theory-driven supervision practices. The proposed conceptual framework provides higher education institutions, supervisors, and policymakers with a valuable lens for rethinking supervision as a pedagogical practice that balances support and independence. While the study is conceptual, it lays a strong foundation for future empirical research to test and refine the model across different institutional contexts. Ultimately, adopting supervision approaches that deliberately move from scaffolding to autonomy holds significant potential to strengthen postgraduate education and research capacity in South African universities and beyond.

Recommendation

Based on the theoretical insights of this study, it is recommended that South African universities adopt theory-informed postgraduate supervision frameworks that explicitly integrate principles of SDT and the ZPD into supervisory practice. Institutions should encourage supervisors to apply adaptive scaffolding strategies that are gradually withdrawn as students’ research competence develops, while simultaneously fostering autonomy, competence, and supportive supervisory relationships. This approach should be supported through targeted supervisor training, clear institutional guidelines on developmental supervision, and alignment of supervision practices with postgraduate throughput and graduation targets. Implementing such a structured yet flexible supervision model is likely to enhance postgraduate productivity, reduce time-to-degree, and improve overall graduation outcomes.

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