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Challenges related to teaching critical thinking in the foundation phase

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Background: Critical thinking is a foundational transversal competence in early childhood education. However, foundation phase teachers face challenges in integrating it into their daily teaching practices in the classroom.

Aim: Our study aimed to explore the support, resources and professional development that foundation phase teachers require to teach critical thinking, while also considering their conceptualisation of the competency.

Setting: The study involved a purposive sample of 10 foundation phase teachers drawn from quintile 1 to 5 schools in Gauteng province, South Africa. All participating schools were located within the Tshwane South District, ensuring representation of teachers with varied experiences in early childhood teaching who participated in semi-structured interviews.

Methods: A qualitative research approach was employed, using deductive and inductive thematic analysis to examine foundation phase teachers' perspectives of critical thinking.

Results: The findings indicated that while teachers acknowledge the importance of fostering critical thinking, they often struggle to clearly conceptualise it. In addition, challenges such as overcrowded classrooms, an overloaded curriculum, time constraints, limited resources and insufficient professional development hinder its implementation. These factors negatively impact teachers' confidence and instructional strategies, restricting the integration of critical thinking into daily teaching.

Conclusion: Addressing these challenges requires structured professional development, improved resource allocation and systemic support to enable teachers to effectively foster critical thinking in young learners.

Contribution: The study highlights the need for targeted interventions to enhance teacher capacity in promoting critical thinking, ultimately strengthening early childhood education in South Africa.

Keywords: classroom constraints; critical thinking; curriculum challenges; early childhood education; foundation phase; professional development; teacher development.

Introduction

The right to education is guaranteed by the *South African Constitution* (RSA 1996) and informed by Sustainable Development Goal (SDG) 4 (Quality Education) (UN 2015). Equipping learners with 21st-century skills (also known as transversal competencies) such as critical thinking, creativity, collaboration and communication is crucial in equipping learners to engage effectively in a world that is increasingly complicated and dynamic (Rapti & Sapounidis 2024). However, in South Africa, achieving these global aspirations is complicated by systemic educational challenges, including inequality, limited resources and curriculum pressures. Transversal competencies are regarded as necessary for continued learning, effective problem-solving and flexibility in a variety of situations (Leibovitch et al. 2025).

Previous studies have examined critical thinking in broader educational contexts; however, few have focused on how foundation phase teachers conceptualise and implement it (Angelianawati et al. 2024). Our study provides evidence that teachers acknowledge the importance of critical thinking but often lack a clear conceptualisation, and highlights how systemic barriers in the South African foundation phase hinder its practical implementation. These insights extend existing literature and underscore the need for targeted professional development and policy support.

Systemic challenges in South Africa's education system, such as overcrowded classrooms characterised by high learner-to-teacher ratios, have a substantial impact on teachers' ability to foster classroom engagement, critical thinking skill development and meaningful learning (West & Mier 2020). Despite general agreement regarding the importance of nurturing the holistic development of cognitive, social and emotional well-being (Pollarolo et al. 2023) during this phase, the South African education system prioritises curriculum coverage over engagement, thereby limiting opportunities for fostering critical thinking that promotes deep cognitive engagement (Leibovitch et al. 2025). In South Africa, translating these competencies into classroom practice remains a formidable challenge (Nikkola, Reunamo & Ruokonen 2022) because of systemic and pedagogical barriers (Rusdin & Ali 2019). Consequently, teachers encounter challenges such as densely packed curricula, time constraints, inadequate resources (O'Reilly et al. 2022), limited professional development (Rapti & Sapounidis 2024), a lack of confidence (Tshangana, Nomtshongwana & Buka 2023) and overcrowded classrooms (West & Meier 2020), all of which hinder the effective teaching of critical thinking skills (Angelianawati et al. 2024).

Our study was guided by Bronfenbrenner's bio-ecological model (Navarro & Tudge 2023) as its conceptual framework to understand the multilayered challenges that affect the teaching of critical thinking. The focus is placed on the microsystem, which encompasses teachers' immediate classroom environments, as this is where challenges such as overcrowding, curriculum overload and lack of confidence most directly impact the teaching of critical thinking. We acknowledge that these are shaped by interconnected influences from the mesosystem (school environment), exosystem (district structures) and macrosystem (national policies and cultural norms). Navarro and Tudge (2023) argue that this framework helps to situate teacher factors as one critical part of a broader, dynamic context impacting instructional practices.

To teach critical thinking skills in the foundation phase, high-quality instruction and open-minded inquiry are required to ensure learners develop the ability to evaluate information (Leibovitch et al., 2025; Arends et al., 2021). In this article, we examine critical thinking as a transversal competence in the foundation phase, where it involves skills such as reasoning, questioning and problem-solving (Rapti & Sapounidis 2024). While we identify key barriers, for example, curriculum overload and limited training, we also highlight enabling factors such as teacher motivation and peer support (Rusdin & Ali 2019).

Literature review

In this literature review, key works by West and Meier (2020), Thornhill-Miller et al. (2023), O'Reilly et al. (2022), Leibovitch et al. (2025) and Akabor and Phasha (2022) are used to frame the systemic and classroom-level challenges of teaching critical thinking. These sources also inform the study's conceptual framework, highlighting how structural and contextual factors shape teachers' practices.

Critical thinking as a transversal competency

Critical thinking is generally understood as the ability to analyse, evaluate and apply reasoning in a thoughtful way (Leibovitch et al. 2025). In early childhood, it involves developing skills such as questioning, predicting, comparing and explaining (Nussbaum et al. 2021). Although traditionally associated with older learners, researchers emphasise that foundational forms of critical thinking can and should be nurtured in young learners through play, inquiry and guided reflection (Leibovitch et al. 2025). Developing critical thinking in the early years supports lifelong learning, fosters problem-solving abilities and prepares learners for active participation in society (O'Reilly et al. 2022). Rapti and Sapounidis (2024) recognise critical thinking as a transversal competence, essential for navigating complex social, academic and emotional challenges.

Transversal competencies prepare learners to navigate the complexities of the modern world (Rapti & Sapounidis 2024). Critical thinking, especially, is an indispensable foundational competency that has garnered widespread recognition for its role in promoting cognitive and metacognitive development (Angelianawati et al. 2024). Originating from John Dewey's work *How We Think* (Dewey 1910), it involves the ability to reason and reflect and to gather, analyse, synthesise and evaluate ideas (Leibovitch et al. 2025), as well as reinforcing opinions with arguments (Rapti & Sapounidis 2024). It also promotes independent and reflective thought (Ennis 1987; Facione 1990; Paul & Elder 2006). According to Robert Ennis (2018:166) critical thinking is 'reasonable reflective thinking focused on deciding what to believe or do'. Leibovitch et al. (2025) further support the view of critical thinking as guiding belief and action.

As a key transversal competency, critical thinking, along with other transversal skills, is foundational to education and for enabling lifelong learning (Leibovitch et al. 2025). Critical thinking is not an instant knowledge transfer to learners, but a common-sense behaviour that is learned by the learners as they grow up (Angelianawati et al. 2024). In spite of the lengthy research tradition of critical thinking as a foundational skill, little is known about how to integrate it into early years education. In South Africa, the early years refer to learners between 6 and 9 years of age in the foundation phase from the reception year (Grade R) to the fourth school year (Grade 3). The foundation phase is critical to establishing literacy, numeracy and life skills (Rapti & Sapounidis 2024) and an important time to foster critical thinking skills that align with the learners' developmental stage (Pollarolo et al. 2023). It is during this stage that young learners' intellectual and social development begins to be shaped (Rapti & Sapounidis 2024).

Systemic challenges related to teaching critical thinking in the foundation phase

It is well-acknowledged that South African classrooms generally suffer from overcrowding (West & Meier 2020), curriculum overload (Thornhill-Miller et al. 2023), time constraints (O'Reilly et al. 2022), and a lack of resources in the form of teaching and learning materials (Leibovitch et al. 2025). In addition, some scholars also argue that cultural norms can serve to inhibit critical thinking and inquiry (O Reilly et al. 2022).

The presence of overcrowded classrooms significantly hinders the cultivation of critical thinking in the foundation phase, as it limits the delivery of individualised attention that is essential for dialogic and inquiry models of teaching (West & Meier 2020). In spite of various policy initiatives to address learner-to-teacher ratios, overcrowding is a pervasive and systemic problem in South African public schools, especially in quintile 1 to 3 schools, where class sizes frequently exceed 40 learners, which is common in low-quintile schools in South Africa (Tshangana et al. 2023). These conditions greatly hinder the implementation of effective classroom management, differentiated instruction strategies, and learner-centred pedagogical practices. This issue is not unique to South Africa; even economically prosperous nations such as the United States have challenges of this nature because of increased enrollment levels (West & Meier 2020). In South Africa, the issue is worsened by the long-standing scarcity of skilled teachers and the dearth of economic resources, with some extreme instances having early childhood classes comprising over 50 learners, far from the ideal ratio of 15 to 20 learners per class (West & Meier 2020). Classroom overcrowding significantly reduces teachers' capacity to involve learners in open-ended questioning and extended discussions, both of which are essential for higher-order thinking development. In addition, teachers consistently indicate that the discrepancy between teaching staff and learner enrollment magnifies the pressure of an already demanding curriculum, further destroying the environment required to advance critical thinking.

Compounding the challenge of overcrowded classrooms is the issue of curriculum overload, which further restricts the time and flexibility needed to implement critical thinking strategies effectively. It has recently been pointed out by Thornhill-Miller et al. (2023) that curriculum overload in South Africa, particularly in the foundation phase, is a pressing issue that negatively impacts teaching and learning outcomes. In particular, the overload refers to the overwhelming number of learning objectives, subjects and assessments that teachers are required to cover in a restricted time, leaving little room for deep learning and learner-centred approaches. Compared to international benchmarks such as Finland's play-based early childhood model as described by Nikkola et al. (2022), South Africa's curriculum is rather content-heavy and assessment-driven, placing significant pressure on teachers and learners alike (Nussbaum et al. 2021). Recent research by O'Reilly et al. (2022) highlights that, internationally, teachers in early childhood settings suffer a high risk of burnout because of overloaded curricula, potentially leading to high turnover rates and poor educational outcomes for young learners.

South Africa's Curriculum and Assessment Policy Statement (CAPS) is more prescriptive and content-heavy than many international early childhood curricula (Nikkola et al. 2022), contributing to the challenges teachers face in integrating transversal competencies. The CAPS demand a structured, assessment-driven approach in the early grades, and Leibovitch et al. (2025) observe that such practices can drive teachers to prioritise curriculum completion over engaging learners in meaningful, interactive and critical thinking activities. Rusdin and Ali (2019) opine that the prescriptive aspect of CAPS can limit creativity to learners' developmental requirements, making it more demanding than some internationally recognised early childhood frameworks, as a result, teachers are compelled to rush through content to meet curriculum requirements (O Reilly et al. 2022), leaving minimal time for reflective teaching practices, creativity or the integration of critical thinking strategies.

Time available for teaching critical thinking is also a significant factor. Teachers must balance administrative tasks, extracurricular activities and diverse learner needs, which leaves little time for critical thinking lessons (O'Reilly et al. 2022) and leads to teachers prioritising content in favour of higher order thinking (Leibovitch et al. 2025). Nussbaum et al. (2021) agree and add that this challenge is worsened by insufficient numbers of support staff, with the workload of teachers leading to stress and emotional exhaustion (Nussbaum et al. 2021). This issue extends beyond South Africa, as seen in Saudi Arabia and Malaysia, where time constraints and curricular demands hinder critical thinking integration (Rapti & Sapounidis 2024). Similarly, Nussbaum et al. (2021) found that rigid educational structures emphasise standardised testing, leading South African teachers to prioritise memorisation over critical thinking because of limited resources. These time limitations are made worse by the lack of appropriate resources, which further hinders the implementation of engaging, thought-provoking activities.

The lack of teaching and learning materials in many South African classrooms compounds the difficulty of promoting critical thinking, especially in under-resourced schools (Rusdin & Ali 2019). As pointed out by Rusdin and Ali (2019), a key challenge appears to be the lack of resources such as textbooks, learning materials and assessment tools. Leibovitch et al. (2025) report that learners often have to share a textbook in groups of eight and cannot complete homework, particularly in disadvantaged community schools where teachers lack training (Makeleni et al. 2023). Leibovitch et al. (2025) argue that teacher education programmes tend to emphasise rote memorisation and fundamental material knowledge instead of teaching methods that promote higher-order thinking, making it difficult for teachers to incorporate critical thinking.

The problem is worsened by a lack of understanding and a restricted incorporation of critical thinking into teacher education programmes (Rusdin & Ali 2019). Yet even when resources are available, another significant and often overlooked barrier to fostering critical thinking lies in entrenched cultural norms and beliefs about teaching, learning and authority in the classroom.

Cultural norms prevalent in most South African societies, and more broadly in many international contexts, can constrain the development of critical thinking, especially in early childhood education (Vandeyar & Mohale 2022). As Akabor and Phasha (2022) mention, where deference to authority is highly prized, teachers are often seen as unquestionable figures of knowledge, and learners may be discouraged from challenging ideas or asking critical questions. In accordance with Vandeyar and Mohale (2022), this kind of hierarchical organisation tends to reinforce obedience and memorisation instead of discussion, questioning and exploration of critical thinking. Vandeyar and Mohale (2022) further illustrate that collaborative learning environments guided by *ubuntu* principles can support learner engagement despite these constraints. In certain cultural contexts, learners are socialised to value group harmony over individual expression, and this may constrain them from speaking up in a group or expressing different opinions (O'Reilly et al. 2022). For teachers in the foundation phase, working with these dynamics not only demands pedagogical expertise but also cultural sensitivity because promoting critical thinking can be seen to promote disrespect and disobedience (Akabor & Phasha 2022). Therefore, in the absence of professional guidance and contextualised approaches, cultural expectations can serve to entrench passivity of learning and counter the intentions of a critically oriented curriculum (Vandeyar & Mohale 2022).

To address restrictive cultural norms hindering inquiry-based learning, targeted professional development, flexible curricula and improved resource allocation are essential (Akabor & Phasha 2022). For example, professional development must equip teachers with strategies to challenge passive learning behaviour and foster an environment where questioning and critical engagement are encouraged. Similarly, O'Reilly et al. (2022) note the importance of training teachers to navigate cultural sensitivities while introducing learner-centred pedagogies that promote inquiry. Flexible curricula are critical because they allow teachers to move beyond rigid, content-heavy structures that prioritise rote learning and standardised assessments (Pollarolo et al. 2023). The curriculum must provide time for discussion and problem-solving (Thornhill-Miller et al. 2023) with resources allocated effectively.

Key issues in teaching critical thinking in the foundation phase

Based on the preceding analysis, we identified the following key barriers to the teaching of critical thinking in the foundation phase, namely: (1) overcrowded classrooms, (2) overloaded curriculum, (3) time constraints, (4) limited resources and inadequate teacher training (Leibovitch et al. 2025; Pollarolo et al. 2023). These challenges do not exist in isolation; rather, they interact to create a complex teaching environment that limits the effective implementation of inquiry-based, learner-centred approaches essential for the development of critical thinking.

Many foundation phase teachers struggle to teach critical thinking effectively, despite its emphasis in the national curriculum as a transversal competence (Leibovitch et al. 2025). This is concerning because critical thinking is foundational to early cognitive development and essential for lifelong learning. In the light of these challenges, we formulated the following research question: *What support, resources and professional development do foundation phase teachers need to teach critical thinking skills?* This overarching question, along with related interview questions, is anchored in the conceptual framework, which shaped both the focus of the inquiry and the structure of data collection and analysis. Ultimately, the goal is to provide practical recommendations for supporting teachers in overcoming these barriers and promoting the integration of critical thinking into everyday foundation phase teaching practices.

Conceptual framework for understanding challenges in teaching critical thinking in the foundation phase

This study is guided by Bronfenbrenner's bio-ecological theory (Navarro & Tudge 2023), with a focus on the microsystem, the classroom environment where teachers operate. While the model informs our perspective, the conceptual framework is derived from the theory to examine teacher-level challenges in implementing critical thinking in the foundation phase. Thus, the conceptual framework operationalises theoretical principles into measurable constructs relevant to this study, and should not be conflated with the model itself. The focus is on five core challenges impacting the teaching of critical thinking: overcrowded classrooms, curriculum overload, time constraints, limited resources and inadequate teacher support. These interconnected domains reflect the core challenges that impact the effective teaching of critical thinking skills in the foundation phase. Rather than relying on a single formal theory, this framework was developed through a synthesis of key literature that explores both systemic and pedagogical barriers in early childhood education. It is informed by the work of scholars such as Pollarolo et al. (2023), Leibovitch et al. (2025) and O'Reilly et al. (2022), whose research highlights persistent issues in global and South African contexts, most notably, the lack of access to quality early learning environments, inadequate teacher preparation and professional development and the impact of socio-economic inequality on learning outcomes. The framework not only informed the design of interview questions but also shaped the coding and interpretation of the qualitative data.

TABLE 1: Conceptual framework for understanding the teaching of critical thinking in the foundation phase.

Domain	Description (derived from literature)
Understanding of critical thinking	Refers to how foundation phase teachers define and interpret critical thinking, often linking it to transversal skills such as creativity, problem-solving, and logical reasoning (Leibovitch et al. 2025).
Teaching strategies	Encompasses instructional approaches that promote critical thinking, such as open-ended questioning, play-based learning and learner-centred discussions. These are frequently limited by contextual and systemic factors (Pollarolo et al. 2023; Cole et al. 1978).
Resources and support	Covers the extent to which teaching resources, school infrastructure and support systems (including parental involvement) enable or constrain the teaching of critical thinking (O'Reilly et al. 2022).
Professional development	Focuses on the need for continuous, relevant training that equips teachers with pedagogical strategies specifically aimed at developing learners' critical thinking skills (Pollarolo et al. 2023).

This conceptual framework (presented in Table 1) provided a structured lens through which to examine teacher experiences and perceptions (O'Reilly et al. 2022). It also served as a guide during the analysis phase, supporting the identification of patterns in the data and allowing us to align findings with recurring themes in the literature (Nussbaum et al. 2021). Each theme in the framework represents a critical area that may either support or constrain the teaching of critical thinking as a transversal competence in the foundation phase. The domains of the conceptual framework are linked to Bronfenbrenner's bio-ecological model: teacher understanding and teaching strategies operate at the micro-system (classroom), resources and parental involvement span the meso- and exosystems (school and community), and professional development is situated in the exosystem, reflecting systemic support for fostering critical thinking.

Study design and procedure

Our study investigated the support, resources and professional development that foundation phase teachers require to teach critical thinking, considering their understanding and conceptualisation of this competency. A qualitative approach was employed, as it allows for an in-depth exploration of teachers' perceptions within their natural classroom environments (Leibovitch et al. 2025). This approach ensures alignment with the research question and study aim by capturing both the contextual supports available and teachers' ability to implement critical thinking in practice. To answer the research question, we purposefully selected quintiles 1–5 schools located in the Tshwane South District of Gauteng province, South Africa, to investigate the challenges and strategies used by teachers in schools with varying resource levels, ranging from relatively well-resourced quintiles 3–5 to those facing significant constraints in quintiles 1–2. In addition, two foundation phase teachers from each quintile (1–5) were chosen to guarantee a balanced representation of teachers from various resource situations. These teachers were chosen to reflect a range of grade levels and teaching experience, ensuring diverse perspectives on the challenges and strategies involved in teaching critical thinking skills. Table 2 presents the demographic characteristics of the study participants.

TABLE 2: Study participants.

School quintile	Position	Experience	Age (years)	Grade levels	Total participants
Quintile 1	Teacher 1	31 years	60	Grade 3	2
	Teacher 2	9 years	47	Grade 1	
Quintile 2	Teacher 3	13 years	37	Grade 3	2
	Teacher 4	4 years	31	Grade 2	
Quintile 3	Teacher 5	6 years	33	Grade 2	2
	Teacher 6	4 years	29	Grade 1	
Quintile 4	Teacher 7	16 years	39	Grade 1	2
	Teacher 8	7 years	34	Grade 3	
Quintile 5	Teacher 9	4 years	33	Grade 2	2
	Teacher 10	9 months	24	Grade 3	

Data collection

The first author conducted in-depth, semi-structured interviews with open-ended questions to learn about teachers' experiences, challenges and solutions for teaching critical thinking (O'Reilly et al. 2022). The interviews were scheduled in person to guarantee convenience and meaningful participation. To maintain consistency, the same semi-structured interview guide and protocol were used for all participants, with audio recordings and verbatim transcriptions ensuring accurate and reliable data capture. The questions were created to help researchers better identify foundation phase teachers' support, resource and professional development needs. Questions were based on existing literature on critical thinking and educational methods, with an emphasis on core concerns affecting teachers' abilities to encourage critical thinking while avoiding extraneous themes to ensure relevance.

The following questions were posed to participants:

- *How do you conceptualise and experience critical thinking in your classroom?*
- *What strategies and methods do you employ to teach critical thinking in the foundation phase?*
- *What resources and support do you consider essential for effectively teaching critical thinking?*
- *What professional development opportunities do you need to enhance your ability to teach critical thinking?*

Data analysis

The conceptual framework served as a guiding structure during the data analysis process by helping to identify and interpret the key challenges teachers face when teaching critical thinking in the foundation phase (Pollarolo et al. 2023). Interview transcripts were analysed thematically (Braun & Clarke 2021), with initial codes aligned to the five domains outlined in the framework: overcrowded classrooms, overloaded curriculum, time constraints, limited resources and insufficient teacher support. These categories enabled the researchers to systematically identify patterns across participant responses and to ensure that the analysis remained grounded in issues highlighted by the literature (Pollarolo et al. 2023). Additionally, the framework supported the identification of gaps and emergent themes beyond the

predefined domains, allowing for both deductive and inductive insights to surface during the interpretation of findings.

Deductive data analysis

We used both deductive and inductive approaches to data analysis. Deductive analysis used the thematic analysis framework to find and categorise themes linked to the topics (Braun & Clarke 2021). Although teachers were asked to define critical thinking, many struggled to articulate their understanding, and this difficulty was captured under the deductive analysis, as it directly relates to the pre-defined domain of teacher conceptualisation. An inductive technique was then utilised to investigate other patterns not covered by the framework, resulting in a more comprehensive comprehension of the dataset. Table 3 shows the findings of the deductive analysis, with exemplary quotes chosen to illustrate major points.

Deductive analysis findings

Table 3 indicates the diverse experiences and difficulties of teachers when cultivating critical thinking across the foundation phase, under the themes *Understanding Critical Thinking, Teaching Strategies, Resource and Support Needs and Professional Training*.

Understanding of Critical Thinking foregrounds the teachers' perceptions of critical thinking, regarded as a crucial skill for solving problems, fostering creativity and developing logical thinking (O'Reilly et al. 2022). Teachers acknowledged the importance of critical thinking in the foundation phase; however, when asked to define or explain their understanding, many struggled to conceptualise it. This indicates that while teachers recognise critical thinking as valuable, their comprehension remains limited, highlighting a significant gap in teacher understanding. Teachers emphasised that critical thinking expands beyond memorisation, cheering learners to engage in deeper, more analytical thinking. One teacher commented, 'Critical thinking is helping learners to solve problems rather than memorize information'. Creativity was identified as a fundamental element of critical thinking, with one teacher explaining, 'Critical thinking helps learners to think differently and to put forward new ideas'. Another teacher contributed, 'Critical thinking means helping learners to link ideas and explain the reasons for their points of view'. These different comments reveal teachers' perceptions of critical thinking as a multifaceted group of skills that includes problem-solving, creativity and analytical thinking.

TABLE 3: Frequency of theme mentions and illustrative quotes.

Themes	Number of instances	Selected representative quote
Understanding of critical thinking	15	*Problem-solving*: 'Critical thinking is about helping the learners solve problems, not just memorizing facts.'
		Creativity: 'Critical thinking is about encouraging learners to think outside the box and come up with new ideas.'
		Logical thinking: 'Critical thinking means helping learners connect ideas and explain why they think a certain way.'
Teaching strategies	18	*Group discussions*: 'We use group discussions, but it's hard to give each child attention when the class is so big.'
		Open-ended questions: 'I ask learners "why" and "how" to get them thinking, but some struggle to respond.'
		Play-based learning: 'Play-based learning is great for critical thinking, but we don't have enough time or materials. '
Resources and support needs	10	*Teaching aids*: 'We don't have enough resources, like books or materials, to make critical thinking activities effective.'
		Parental involvement: 'Parental support is crucial, but we don't have enough programs to get parents involved in developing critical thinking at home.'
		Classroom infrastructure: 'Our classrooms are too crowded to do interactive activities.'
Professional development	12	*Targeted training*: 'I feel like I need more training in teaching critical thinking, but the workshops I've attended don't focus on it specifically.' *On-going support*: 'We attend training sessions, but there's no follow-up or support afterwards.'
		Practical application: 'Most training is too theoretical; we need hands-on strategies we can use in class.'

In conclusion, participants recognise the significance of critical thinking in early childhood education and identify problem-solving, creativity and logical reasoning as essential elements of critical thinking. Nevertheless, they emphasise the necessity of support in the utilisation of critical thinking skills. Therefore, there is a need to address these gaps with targeted professional development and instructional support to enhance the critical thinking abilities of young learners (Leibovitch et al. 2025).

Teaching Strategies discussed methods employed by teachers to stimulate learners' critical thinking. Group discussion, open questions and play were mentioned and regarded as effective in building critical thinking skills. However, teachers were frustrated with the constraints they faced in implementing these strategies. For example, although group discussions are a typical instructional strategy, one teacher commented, 'We do group discussions, but it's hard to give each child attention when the class is so big'.

This observation underscores the challenge posed by large class sizes, which make it impossible for teachers to provide every learner with individualised attention. Although play-based learning was valued for fostering critical thinking, teachers faced time and resource constraints. As one teacher noted, 'Play-based learning is good for critical thinking, but we do not have enough time or resources'.

This reveals the challenge that exists between ideal pedagogical approaches and organisational constraints for teachers. With this in mind, teachers acknowledge and try to apply strategies to foster critical thinking, but challenges such as overcrowding, resource constraints and time limitations undermine their efficacy. Tackling these strategies through structural support, in-service training and adaptive curricula will be essential in fostering the teaching of critical thinking in the foundation phase.

Resources and Support Needs reveal teachers' concerns about insufficient resources, a lack of parental involvement, and

inadequate classroom infrastructure that hinder the ability to teach critical thinking. Teachers reported that limited parental involvement constrains the development of learners' critical thinking. One teacher explained, 'When parents are not involved, learners struggle to apply classroom activities, making it harder to develop reasoning and problem-solving skills'.

This highlights that fostering critical thinking requires collaboration between teachers and parents. In addition, teachers noted a lack of teaching aids, for example, books and educational materials. One teacher commented, 'We don't have enough resources, like books or materials, to make critical thinking activities effective'.

Furthermore, a scarcity of structured initiatives to engage parents in promoting critical thinking at home was identified. Teachers emphasised the importance of family support; however, one teacher stated, 'Parental support is crucial, but we don't have enough programs to get parents involved in developing critical thinking at home'.

This underlines the need for increased community involvement and enhanced resource access in fostering critical thinking. Furthermore, teachers identified overcrowded classrooms as a major difficulty, with one teacher stating, 'Our classrooms are too crowded to do interactive activities'.

The findings indicate that a lack of resources, limited parental involvement, and overcrowded classrooms challenge the development of critical thinking. Teachers struggled to define critical thinking, but consistently acknowledged its importance, highlighting a gap between recognition and conceptual understanding that requires targeted support and professional development.

Lastly, the *Professional Development* theme echoed teachers' dissatisfaction with available professional development opportunities. Although teachers recognised the importance of professional development, they indicated a desire for more specific training in how to teach critical thinking skills. One teacher commented, 'I feel a need for more training in teaching critical thinking; however, the workshops I have attended do not directly focus on it specifically'.

Furthermore, teachers complained about the absence of follow-up support after the initial training sessions. A teacher said, 'We attend training sessions, but there is no follow-up or support afterward'. This quote underscores the limitations of one-time training programmes lacking follow-up support or practical strategies. Teachers expressed strong dissatisfaction with overly theoretical training programmes, demanding, 'Most training is too theoretical; we need hands-on strategies we can use in class'. This reaction expresses a definite desire for practical, classroom-centred training that addresses issues facing teachers while promoting critical thinking.

Findings indicate that professional development workshops are lacking as they do not provide follow-up, support, and hands-on application. Therefore, focused, experiential training can increase teacher preparation. Our research demonstrates that although teachers recognise the importance of critical thinking, they struggle with its implementation because of the lack of whole-school programmes (Rusdin & Ali 2019). Teachers emphasised the need for system-wide coordination, from district support to classroom teaching, a gap in previous research (Leibovitch et al. 2025). This contrasts with earlier studies, which examined the behaviour of single teachers, thereby suggesting a system problem that has not been fully addressed (Pollarolo et al. 2023).

We discovered that teachers prefer practical, continuous and context-specific professional development instead of general training, as supported by previous studies on the necessity of intensive continuous learning (Angelianawati et al. 2024). Also, our research stresses the necessity of both community and parental involvement in the development of critical thinking, which is parallel to the findings of Pollarolo et al. (2023), who all stressed the requirement for collective effort. The results of our study bring into question the focus on individual teacher accountability and point to the necessity of an inclusive, community-based strategy for building critical thinking in early childhood education (Rapti & Sapounidis 2024).

Our findings show that overcoming these challenges requires a systemic response, with policymakers, schools and communities collaborating to support teachers in fostering critical thinking. Teachers expressed a need for practical, context-specific solutions, for example, collaborative frameworks of teaching and peer mentoring within schools, to share ideas and grow capacity (Tshangana et al. 2023). Teachers identified how, despite a lack of resources, they managed to integrate critical thinking into everyday lessons by using inquiry-based learning and problem-solving, demonstrating that innovative, resourceful approaches can still thrive despite challenges. Similar findings (Rusdin & Ali 2019) show that teachers can foster critical thinking in low-resource settings using low-cost, flexible methods such as inquiry-based learning. Other research highlights the necessity for increased resource provision, while other arguments outweigh teacher innovation (Rapti & Sapounidis 2024). Our findings show the need for teachers' transformation and systemic support while recognising existing positive practices that can be enhanced.

Our findings underscore the development of context-specific, evidence-based interventions that go beyond general policy prescriptions to address structural and pedagogical constraints found in South African educational environments. West and Mier (2020) identified concerns such as overcrowding and overloaded curriculum, but our research offers an advanced perspective through the need to emphasise coordination across the school system and involve communities in boosting critical thinking. In contrast to prior

studies, which were dominated by an emphasis on difficulties faced, we highlight creative teacher-led approaches such as inquiry-based learning and peer-to-peer teaching, which have successfully worked in disadvantaged schools. This contrast makes our research compelling, as it highlights the potential to adapt current teaching methods into scalable, sustainable frameworks for teaching critical thinking, addressing gaps in previous research.

Inductive data analysis

Following the deductive analysis, an inductive process was employed to reveal other challenges that were outside the conceptual framework. Our study identified key challenges in teaching critical thinking in the foundation phase, including structural, psychosocial, time constraints and systemic influences. The problems that were not addressed show gaps in current literature and reveal the complexities of applying critical thinking in real-world contexts. Table 4 provides a summary of the findings.

Ethical considerations

Ethical clearance was granted by the relevant Research Ethics Committees of the University of Pretoria. The ethics protocol number is EDU075/24. Thereafter, permission to conduct the study was applied for and granted by the Gauteng Department of Education.

In accordance with ethical research norms, participants provided informed consent, ensuring voluntary participation. Participants were given full information about the study's aim, procedures and rights, including the ability to withdraw at any time without penalty. The study followed the institutional ethical norms, which ensured that all interviews were carried out respectfully and transparently. To ensure confidentiality, all participants were assigned pseudonyms (Teacher 1 to Teacher 10) to protect their identities, and data were securely stored to avoid unwanted access. Anonymity was guaranteed by removing identifiable information from the data.

TABLE 4: Emerging themes from inductive analysis quotes.

Themes	Number of instances	Representative quote
Structural and classroom challenges	9	*Overcrowded classrooms:* 'With more than 45 learners in a class, it's impossible to give everyone the attention they need to develop higher-order skills like critical thinking.' (Teacher 1)
		Curriculum overload: 'There's too much to cover in the curriculum, so we're focused on getting through it instead of encouraging learners to think critically.' (Teacher 7)
		Time constraints: 'The day is too short to cover everything, let alone giving learners space to think critically.'. (Teacher 5)
Psychosocial barriers	7	*Lack of confidence:* 'I know it's important, but I don't have the confidence to teach it. It feels overwhelming.' (Teacher 3)
		Self-efficacy: 'I feel like I need more training in teaching critical thinking, but the workshops I've attended don't focus on it specifically.' (Teacher 2)
		Cognitive load and stress: 'The school day is so packed that even if I want to explore deeper questions with my learners it's stressful, I can't. Time is always against us.' (Teacher 4)
Time constraints	10	*Insufficient time for critical thinking activities:* 'The day is too short to cover everything, let alone giving learners space to think critically.' (Teacher 5)
		Focus on syllabus coverage: 'We are under constant pressure to cover the curriculum. There's barely any time left for anything outside the syllabus, let alone critical thinking activities.' (Teacher 9)
		Fast-paced learning environment: 'The pace of the curriculum is relentless, and by the time we finish one lesson, it feels like we need to rush into the next, leaving no room for reflective thinking.' (Teacher 2)
Institutional and systemic constraints	7	*District-level support:* 'There's no real support from the district. We're left to figure it out on our own.' (Teacher 8)
		Parental involvement: 'Parental support is crucial, but we don't have enough programs to get parents involved in developing critical thinking at home.' (Teacher 7)
		Inadequate professional development and follow-up: 'We attend training sessions, but there's no follow-up or support afterward.' (Teacher 3)

Results

Inductive analysis findings

Based on Table 4, our study gives a more in-depth knowledge of how teachers deal with and adapt to the problems they experience when teaching critical thinking in the foundation phase. While overcrowding, curriculum overload and time constraints are well-documented challenges in education research (Pollarolo et al. 2023), our study provides new insights into how teachers in South Africa overcome these challenges. Importantly, it demonstrates teacher resiliency and creative techniques used in practice, which are missed in larger policy discussions.

One notable finding is that, in spite of structural challenges, teachers created context-specific, creative strategies for integrating critical thinking by altering lesson plans to promote discussion (Rapti & Sapounidis 2024). Peer interaction was helpful, as informal networks facilitate mutual support and professional growth in spite of the lack of district support. Although research cites a lack of professional development, ours highlights a critical distinction: teachers need ongoing, specialised critical thinking training. Current professional development includes a broad subject matter, which is mainly focused on general pedagogical practice rather than the needs of foundation phase teachers. Teachers expressed a strong need for practical workshops specific to their own classrooms, reiterating the consideration that one-size-fits-all approaches are insufficient.

Furthermore, our study points to a gap in systemic support that extends beyond professional development to include increased parental involvement (Vandeyar & Mohale 2022). Teachers recognised the significance of involving parents in order to foster critical thinking outside of the classroom, but they indicated that formal programmes for parental engagement were non-existent. This is valuable as it highlights the need for schools to create partnerships with parents to foster critical thinking at home, creating a continuous learning environment for learners.

What sets our study apart is its contribution to understanding how small-scale interventions and teacher agency can have a considerable impact in the face of systemic challenges. However, our study is limited by its small sample of 10 teachers from the Tshwane South District, reliance on self-reported interview data, and focus on micro-level teacher experiences, which may not capture broader systemic or policy-level influences. Despite structural and pedagogical constraints, teachers displayed amazing adaptability and dedication to developing critical thinking (O'Reilly et al. 2022). Our study emphasises that, while the challenges to teaching critical thinking in South African schools are significant, the opportunities for creative solutions and support are also many. Participants provided practical insights into how to create support structures in schools and communities to improve critical thinking pedagogy.

Overall, our findings shed light on how teachers might use context-specific strategies to navigate systemic constraints. It adds to the expanding body of research by illustrating that, while challenges exist, meaningful steps may be taken to solve them, notably through targeted professional development, peer collaboration and community involvement. Our findings highlight the need for a more supportive, adaptable and responsive education system to address teachers' challenges. While long-term reforms are required to address systemic issues such as overcrowded classrooms and curriculum overload, immediate initiatives can be implemented to aid teachers in a more practical way.

In the short term, further investment in focused professional development, particularly in workshops on critical thinking pedagogy, could give teachers specific classroom techniques. Furthermore, the development of stronger peer collaboration and community partnerships can result in more solid support systems within schools, where teachers can exchange resources and ideas even with modest external assistance. Context-specific interventions are also feasible, including the creation of teacher-led initiatives for designing critical thinking tasks aligning with the existing curriculum. Such initiatives could be pilot studies or school-based projects incorporating the ideas and innovations proposed by teachers involved in the research.

While addressing broader educational reforms is a long-term goal, there is plenty of time to act now, using teachers' creativity and resourcefulness to begin making a difference in the classroom (Pollarolo et al. 2023). A combination of context-specific strategies and systemic reforms can pave the way for a more long-term approach to encouraging critical thinking in early childhood education.

Discussion

Our study, using deductive and inductive analysis, highlights challenges and opportunities in promoting critical thinking in the foundation phase. Despite recognising its importance, teachers face structural, pedagogical and systemic barriers. We discuss these challenges and explore ways to support teachers.

Overcrowding remains a major challenge. Teachers reported that large classes restrict individualised attention and interaction, which is consistent with the literature (West & Mier 2020). Curriculum overload worsens this by compelling teachers to prioritise content coverage at the expense of critical thinking. Although previous studies have recognised similar limitations, this research (Leibovitch et al. 2025) offers novel contributions by revealing emotional and cognitive stresses experienced by teachers and thereby underlining the need for interventions aimed at enhancing classroom environments and teachers' well-being.

Participants indicated that they did not feel confident (Makeleni et al. 2023) in teaching critical thinking because of insufficient training and support. Professional development workshops available do not offer effective ways of incorporating critical thinking (Pollarolo et al. 2023). Competing objectives cause cognitive fatigue, which undermines the capacity of teachers to teach effectively. Self-efficacy plays a crucial role in the implementation of new procedures (Vandeyar & Mohale 2022). To address this, professional learning programmes need to be designed for foundation phase classrooms with an emphasis on inquiry-based learning. Teacher collaboration, including peer mentorship and lesson sharing, can boost confidence and competence, with formal professional learning communities offering an affordable and effective solution (Makeleni et al. 2023).

The study brings out the contradiction between curriculum demands and meaningful critical thinking participation. Teachers noted that they had to race through the curriculum with minimal space for questions of higher order. This resonates with international studies demonstrating that inflexible curricula limit abilities to provide space for more profound cognitive engagement (Rapti & Sapounidis 2024). Despite these limitations, our research found that teachers successfully integrated critical thinking through narrative and discussion-based activities. This suggests that, even within rigid frameworks, some teaching choices can be impactful. Further research should explore how to formalise and expand these practices.

Participants reported a lack of support from district leaders and too little parental involvement in critical thinking development. Although this development continues outside the school, schools do not systematically involve parents. Additionally, professional development workshops are often not followed up on, decreasing their effectiveness in the long term. Teachers should collaborate for an institution-wide initiative in critical thinking to promote pedagogical transformation.

Our research strongly points to parental involvement as an unused variable for acquiring critical thinking skills. Previous research by Vandeyar and Mohale (2022) included curriculum alignment and teacher training, but our results indicate that providing parents with resources to allow questioning and problem-solving at home significantly impacts learning. Interventions that enable family involvement lead to increased learner participation and critical thinking, as observed by highlighting the importance of teacher-parent corporations.

While our research is concerned with challenges facing teachers in the foundation phase at the classroom level (micro-system), it should be mentioned that such challenges are interconnected. In line with Bronfenbrenner's bio-ecological theory, aspects such as curriculum policy (macro-system) and staff development at the district level (exosystem) indirectly influence what can happen within the classroom context (Navarro & Tudge 2023). This holistic view highlights the necessity for systemic, multilevel interventions to address identified barriers.

Recommendations

In order to foster critical thinking in the foundation phase, our study recommends targeted, ongoing professional development that involves hands-on strategies designed specifically for foundation phase classrooms (Leibovitch et al. 2025). In addition, schools should foster critical thinking through problem-solving activities, structured questioning and inquiry-based learning that is age-appropriate (Rapti & Sapounidis 2024). Moreover, the curriculum should be flexible and allow time for teachers to foster critical thinking by asking questions as opposed to rushing to cover the prescribed curriculum, which often leads to rote memorisation and limits higher-order thinking skills (Pollarolo et al. 2023). Furthermore, teachers should be allowed to collaborate with peers and neighbouring schools to share their best practices of fostering critical thinking in their classrooms (Tshangana et al. 2023).

Consequently, schools should initiate programmes for parents to cultivate critical thinking skills within the home setting, and the district authorities need to be involved in this process with the support of practical application and better teaching methods for teachers. Our recommendations align with recent studies by Leibovitch et al. (2025), emphasising the need for context-specific pedagogical strategies that provide teachers with both practical strategies and theoretical knowledge. Lastly, increasing structural support and stimulating collaboration between teachers, researchers and policymakers is crucial in making sure that critical thinking becomes a foundational skill in the foundation phase.

Conclusion

In summary, our study confirms challenges documented in the literature, including a lack of resources, overcrowded classrooms and limited parental involvement (O'Reilly et al. 2022; Pollarolo et al. 2023). A novel finding is that teachers struggle to conceptualise critical thinking despite acknowledging its importance, highlighting a gap not widely reported in foundation phase research. This divergence underscores the need for targeted professional development and systemic support, demonstrating the study's contribution by linking teacher awareness, contextual constraints and practical barriers in teaching critical thinking.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

P.M.Z. conceptualised the study, conducted the data collection and analysis, and drafted the manuscript. S.H.V. provided overall research and writing guidance, including conceptualisation, methodology, review, and journal selection. M.F.O. contributed to data interpretation, critical review, and refinement of the manuscript.

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Data availability

The data supporting the findings of this study can be obtained from the corresponding author upon request, P.M.Z.

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