Chess as a Tool to Enhance Learning in Early Childhood Education in South African Rural Primary Schools

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ABSTRACT
Innovative strategies are urgently needed to improve learning and engagement in resource-constrained rural South African classrooms. Despite the potential of non-traditional tools, little research has investigated how chess can support early childhood education in these contexts. This study addresses this gap by exploring how chess, through the Tsogo Sun Moves for Life (M4L) programme, affects learning, participation, and behaviour in early childhood classrooms. A qualitative research design was employed, with data collected through semi-structured interviews with sixteen participants, including teachers, an education district official, and the chess program coordinator. The data were analysed thematically to identify patterns in experiences and perceptions. Findings indicate that chess enhances learner motivation, concentration, and active participation, while promoting social skills such as teamwork, patience, and resilience. Participants reported that chess transformed classrooms into inclusive and dynamic learning environments. This study demonstrates that chess is a low-cost, practical strategy for supporting holistic learner development in rural schools. By highlighting the educational benefits of chess, this research contributes to the knowledge base on inclusive pedagogy and curriculum innovation in early childhood education.

Keywords: Chess, Early Childhood Education, Innovative Teaching, Tsogo Sun Moves for Life

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1. INTRODUCTION

The quality of education in South Africa is uneven, particularly in rural schools where learners face multiple challenges, including overcrowded classrooms, resource shortages, and limited support strategies (Scholz et al., 2008). These conditions often hinder learners' engagement, academic performance, and overall development. Innovative teaching approaches are increasingly needed to address these challenges and to create learning environments that stimulate cognitive, behavioural, and social growth. One such promising approach is the integration of chess into the Foundation Phase curriculum through programmes like the Tsogo Sun Moves for Life (M4L) initiative.

Research indicates that chess can enhance a range of cognitive skills, including problem-solving, concentration, spatial reasoning, and planning, all of which are crucial for academic achievement (Bart, 2014; Sala et al., 2017; Agüero Jiménez and Lainé Oquendo, 2017; Saxena, Lo, Hew & Wong, 2020). Studies have consistently shown that chess training can improve mathematical performance and support the development of critical thinking and executive functioning in young learners (Barrett & Fish, 2011; Trinchero & Sala, 2016). These cognitive benefits extend to higher-order thinking skills such as analysis, synthesis, abstraction, and foresight, which are important for mastering foundational academic concepts (Alifirov et al., 2018; Ferguson, 1995). Beyond cognitive development, chess also fosters behavioural and social skills. It encourages learners to manage wins and losses gracefully, develop patience, work collaboratively, and persevere in problem-solving, all of which promote positive classroom participation and social interaction (Gobet & Campitelli, 2006; Ferguson, 1995; Scholz et al., 2008).

Although global research has highlighted the educational value of chess, particularly in enhancing learner motivation, engagement, and strategic thinking (Karakus, 2023; Çubukçu & Kahraman, 2017; Ferreire & Palhares, 2008), little is known about its use in early childhood education within rural South African contexts. Specifically, there is a lack of research exploring how teachers perceive the integration of chess in their classrooms and its influence on learners' learning outcomes, behaviour, and engagement. Addressing this gap, the present study investigates how the inclusion of chess in Foundation Phase classrooms in the King Cetshwayo District influences learners' academic performance, participation, motivation, and concentration. By focusing on teachers' perspectives, the study aims to provide empirical insights into the potential of chess as an accessible, innovative, and multifaceted pedagogical tool for supporting holistic learner development in under-resourced rural schools.

Theoretical Framework

This study is underpinned by constructivist learning theory (Piaget, 1972) and sociocultural theory (Vygotsky, 1978), which together provide a lens to understand how chess supports learning, engagement, and cognitive development in early childhood education. Both theories emphasize active participation, social interaction, and the development of higher-order thinking skills, providing a framework for interpreting the study's findings.

Constructivist theory posits that learners actively construct knowledge through experience, problem-solving, and reflection, rather than passively receiving information. In the context of this study, chess serves as a constructivist tool, allowing learners to engage with abstract concepts such as strategy, planning, and cause-and-effect relationships in a tangible manner. For example, when learners anticipate opponents' moves and decide on strategies, they are actively constructing knowledge by testing hypotheses and evaluating outcomes. The observed improvements in concentration and decision-making among learners can be understood as evidence of constructivist learning: chess provides opportunities for experimentation, reflection, and cognitive engagement that deepen understanding and support skill development.

Sociocultural theory emphasises the role of social interaction and scaffolding in learning, particularly within Vygotsky's Zone of Proximal Development (ZPD), which represents the gap between what learners can do independently and what they can achieve with guidance. Chess serves as a scaffolded activity in the classroom: teachers guide learners through the rules, strategies, and

problem-solving processes, enabling them to operate at higher cognitive levels than they could alone. Peer interaction in chess—such as observing others' moves, discussing strategies, or providing feedback—further supports cognitive growth. The improvements in collaboration, patience, and resilience observed in this study demonstrate how sociocultural principles are applied in practice: learning is enhanced through structured guidance and social engagement.

By integrating constructivist and sociocultural perspectives, this framework provides a dual lens to analyse the study's findings. Chess engages learners cognitively through active, hands-on problem-solving (constructivism) while simultaneously promoting collaborative learning, guidance, and scaffolding (sociocultural theory). For instance, a learner's ability to plan several moves ahead while receiving peer feedback demonstrates both individual cognitive development and socially mediated learning. This analytical linkage strengthens the interpretation of findings, showing that improvements in concentration, participation, behaviour, and motivation are not only outcomes of the activity itself but also reflections of the theoretical principles underpinning the study. Situating chess within these theories highlights its potential as a holistic pedagogical tool that addresses both cognitive and social-emotional learning in early education.

Literature Review
Chess as an Educational Tool

Over the years, chess has increasingly been recognised not only as a recreational activity but also as a potentially valuable educational tool. Early literature (e.g., Scholz et al., 2008; Sigirtmac, 2011) emphasizes how chess requires higher-order thinking, where learners must analyze positions, anticipate opponents' moves, and develop long-term strategies. A more recent systematic review confirms that chess can influence cognition and learning among schoolchildren, though effects vary across studies (Campitelli, Labollita, & Bilalić, 2025). Moreover, a very recent experimental study among young children found that integrating chess teaching in early childhood classrooms significantly improved attention, memory, logical thinking, and even academic performance in mathematics and reading compared to control groups (Gao, Feng, Chen, Ping, 2021; Yakushina, Chichinina, & Dolgikh, 2025). This supports the idea that chess can function as a pedagogical strategy in formal education, contributing to both cognitive and academic development. However, not all findings are uniformly strong. For instance, a carefully controlled study examining whether chess instruction improves mathematical problem-solving (with both active and passive control groups) found no significant difference between the chess group and control groups after intervention (Sala & Gobet, 2017). This suggests that while chess may support cognitive skills, benefits for academic skills (like mathematics) may not always emerge, especially if compared with other intellectually engaging activities.

Thus, the literature presents a mixed picture: some studies report clear cognitive and academic benefits, while others, especially those with more rigorous control conditions, show modest or no gains at all. This mixed evidence signals a need for more context-sensitive research, especially in under-resourced or rural environments such as those in South Africa.

Chess, Early Childhood, and Executive Function / Social-Emotional Skills

Recent research has begun to examine chess not only for its cognitive benefits but also for its broader developmental outcomes in young children. A 2025 study with preschool-aged children (5–6 years old) found that those attending chess classes scored significantly higher in visuospatial working memory compared to peers who did not participate in chess (Yakushina, Chichinina, & Dolgikh, 2025). Another 2025 study involving different teaching models (classroom integration vs extracurricular) reported that chess instruction improved children's attention, memory, logical thinking, self-discipline, patience, and even academic performance in reading and mathematics (Ye, 2025). In addition, a qualitative study conducted in a South African preschool context recently suggested that structured play (though not limited to chess) can support the development of executive

function skills, planning, self-regulation, and working memory, which are crucial for early childhood development (Campitelli, Labollita, & Bilalić, 2025). This supports the applicability of chess as a structured-play intervention in contexts similar to yours.

On the social and emotional side, a 2023 study examining parents' perspectives on chess involvement reported that many parents perceived chess as beneficial for children's discipline, patience, self-control, and social skills, including empathy and respect for others (Ye, 2025). However, the same study also warned about possible downsides: certain aspects of chess culture (e.g., competitiveness, elitism, or exclusion) could create social pressure, potentially discouraging some children rather than empowering them (Yakushina, Chichinina, & Dolgikh, 2025).

Critical Gaps and Contrasting Perspectives

While many studies highlight positive outcomes for cognition, behaviour, and academic performance, the evidence is far from unanimous. As noted, rigorous experimental studies (with active control groups) sometimes find minimal or no academic benefit (Sala & Gobet, 2017). This raises questions about whether chess, per se, is more beneficial than other cognitively engaging activities, or whether benefits stem simply from increased engagement or novelty effects.

Moreover, much of the existing literature still originates from well-resourced, urban, or middle-class contexts (e.g., Europe, Asia, or urban schools in various countries), which may not accurately reflect the experiences of under-resourced or rural schools in South Africa. Finally, there is limited research that explores possible negative or neutral effects, such as exclusion of learners who struggle with the game, frustration after repeated losses, or increased competitiveness that may not suit all learners (Ye, 2025). This suggests the need for more context-specific, longitudinal, and mixed-method research (especially in low-resource settings) before strong claims about chess as a universal educational tool can be made.

2.   METHOD

Research Design

This study employed a qualitative research approach to capture the lived experiences, perspectives, and reflections of teachers and programme facilitators involved in the Tsogo Sun Moves for Life (M4L) initiative. This approach was appropriate as the research sought to explore meanings and understandings rather than quantify outcomes. The focus was on how participants experienced the integration of chess into their early childhood classrooms, particularly in terms of its impact on learner behaviour, participation, and educational outcomes.

Participants

The study was conducted with sixteen participants drawn from King Cetshwayo District in KwaZulu-Natal. The sample comprised fourteen Foundation Phase teachers, one education district official, and one Tsogo Sun Moves for Life coordinator. The teachers were all facilitators of the M4L chess programme in their respective schools. Demographic data revealed that most teachers were female, with only one male teacher in the group. The wider sample included one female programme coordinator and one male district official, bringing the total to fourteen females and two males. The majority of the teachers were over the age of forty-five, suggesting that they were in the later stages of their careers. Fourteen participants identified as African and two as Asian. All participating teachers taught in the Foundation Phase, primarily Grade 3 (eight teachers), with a smaller number teaching Grade 2 (two teachers) and Grade 1 (four teachers). These teachers were responsible for teaching all Foundation Phase subjects, i.e. home language (isiZulu), first additional language (English), mathematics, and life skills. A purposive sampling strategy was employed to select participants who had direct experience with implementing chess in the classroom, ensuring that the sample could provide rich, relevant, and informed insights into the research phenomenon.

Data Collection

Data were collected through questionnaires and semi-structured interviews. The questionnaires gathered demographic and professional information, such as gender, age, teaching post level, subjects and grades taught, and chess experience. This helped contextualise participants' perspectives. Semi-structured interviews explored participants' experiences of integrating chess into classroom practice, including perceived benefits, challenges, and impacts on learners. The interviews employed open-ended questions, allowing for flexibility and enabling the researcher to probe deeper when relevant themes emerged. Interviews were conducted in a conversational tone to encourage participants to speak freely and share detailed personal examples. All interviews were audio-recorded with participants' consent and transcribed verbatim for analysis.

Data Analysis

Data from questionnaires and interviews were analysed using thematic analysis (Burke & Clarke, 2006). The analysis followed a systematic process: first, transcripts were read multiple times to achieve familiarisation; second, initial codes were generated from patterns observed in the data; third, codes were grouped into overarching themes and sub-themes; and finally, themes were reviewed and refined to ensure they accurately represented the dataset. Both explicit (surface-level) and implicit (underlying) meanings were considered, allowing for a comprehensive understanding of participants' experiences.

Trustworthiness

To ensure the credibility and trustworthiness of the findings, several strategies were employed. Triangulation was achieved by combining questionnaire data with interview narratives, providing multiple perspectives on the phenomenon. Member checking was conducted by sharing preliminary findings with participants to confirm that the interpretations accurately reflected their experiences. An audit trail was maintained by documenting all research decisions and analytic processes, enhancing transparency and dependability. Reflexive journaling was also used throughout the research to mitigate potential researcher bias and maintain objectivity.

Ethical Considerations

This study was approved by an institutional ethics committee with certificate number: 17110-030 PGD 2017/169, the KwaZulu-Natal Department of Education, and Tsogo Sun Moves for Life. The study adhered to ethical research principles throughout. Participants were informed about the purpose of the study, and their voluntary consent was obtained. Confidentiality was ensured by using pseudonyms and withholding identifiable details in the reporting of findings. The study aimed to respect the participants' perspectives and accurately and responsibly represent their experiences.

3. RESULTS AND DISCUSSION

Participants' Chess Background

Teachers reported limited prior experience with chess before the programme. None had participated in rated tournaments, and knowledge ranged from basic rules learned in workshops to minimal understanding acquired during programme training. This highlights that the observed classroom impacts were largely due to the structured M4L programme rather than prior expertise. Even novice teachers were able to facilitate meaningful learning experiences, illustrating the accessibility of chess as an educational tool.

Chess as an Educational Enhancer

Participants consistently reported that chess enhanced teaching and learning. All agreed it supported curriculum delivery, increased learner motivation, and created dynamic classroom environments. As Participant H explained:

> "Chess often serves as a bridge, bringing together children of different ages, races and genders in an activity they can all enjoy…Chess has led to increased motivation, improved behaviour, better self-image, and even improved attendance."

Similarly, Participant K observed:

> "Chess makes them excited to participate, they want to be part of it, and that excitement carries over to other learning activities."

The M4L coordinator emphasized the broader educational value:

> "Chess develops critical thinking, patience, and problem-solving skills, which learners can apply in the classroom and in life."

These findings align with constructivist theory, which posits that learners actively construct knowledge through hands-on engagement, and with sociocultural theory, which emphasizes the role of social interaction and scaffolding in learning. Chess was not only a subject-specific tool but also a means of promoting holistic development.

Active Participation and Learner Agency

Teachers highlighted that chess fostered inclusive participation. Even in overcrowded classrooms, chess engaged learners who typically remained passive. Differentiated tasks allowed high-achieving learners to be challenged while providing additional support to students who struggled. Participant A described the excitement chess generated:

> "My learners are still learning how to play chess, but when I mention the word chess they jump for joy…if I have a chess object…they will participate because they know that we will play afterwards."

Learner choice further enhanced engagement. Participant I noted:

> "I involve my learners in almost everything in this class…this way I am able to ask them why they did not finish…It means they wanted to do that specific one, so why would they not finish then?"

Participant C added:

> "By letting them choose activities from the workbooks, they will be excited and do the work they have chosen themselves."

These examples illustrate how chess promoted learner agency, reinforcing motivation and engagement in line with constructivist principles.

Fun and Motivation Through Chess

Chess introduced an element of play that increased learner enthusiasm and participation. Participant K described:

> "Before, it was a struggle to get all of them to listen…now that I use chess…they do not even notice they are learning."

Participant N observed:

> "Even the 'not so gifted' learners…take part when it comes to playing chess. They like it better when we play using the pieces than when we are learning using the workbooks."

Participant E added:

> "Chess involvement in the classroom…brings out the best in the learners;…they forget that they are still in the classroom."

The anticipation of playing chess after academic work created natural motivation, turning chess into both a reward and a learning tool that supported sustained attention and positive attitudes toward learning.

Concentration and Cognitive Development

Teachers consistently reported improvements in learners' concentration and self-discipline. Participant E reflected:

> *"At the beginning of the year this class was unruly, but now they are better. They listen better…and they now pay attention when I am teaching."*

Participant H noted:

> *"They are very young…they listen attentively and ask if they do not understand."*

Chess's structured nature trained learners to think critically, exercise patience, and avoid hasty decisions. Participant N explained:

> *"When learners play chess, they learn to focus on the game for a longer period…which also helps when they are doing classwork or solving problems."*

These observations suggest that chess functions as a cognitive scaffold, improving executive functioning skills such as sustained attention, planning, and problem-solving, consistent with findings in both constructivist and sociocultural frameworks.

Synthesis and Theoretical Interpretation

Overall, the findings show that chess enhances early childhood education through multiple interrelated pathways: it increases engagement, promotes active participation and learner agency, introduces fun and intrinsic motivation, and strengthens concentration and cognitive skills. Importantly, the integration of chess into classroom practice demonstrates how theoretical principles of knowledge construction (Piaget) and guided social interaction (Vygotsky) manifest in practical, measurable outcomes. Even with teachers of limited prior chess experience, the programme created meaningful learning opportunities, supporting both academic and social-emotional development in rural classrooms.

Discussion

The findings of this study indicate that integrating chess into early childhood education through the Tsogo Sun Moves for Life (M4L) programme offers multiple educational, cognitive, and socio-emotional benefits. This discussion critically interprets these results in light of existing literature and theoretical frameworks, showing how chess functions as a pedagogical tool that supports holistic learning and learner engagement.

Participants consistently reported that chess enhanced teaching and learning by making lessons more interactive and supporting curriculum delivery. Improvements in learner motivation, confidence, and behaviour were noted across classrooms. This aligns with research highlighting that chess fosters critical thinking, problem-solving, planning, and decision-making skills (Sala et al., 2017; Sala & Gobet, 2016). Importantly, these cognitive gains are not limited to isolated chess activities but transfer to broader academic tasks, illustrating how chess can complement and enrich traditional pedagogical approaches. From a theoretical perspective, these findings are supported by constructivist learning theory (Piaget, 1972), which posits that knowledge is actively constructed through experience and reflection. Chess allows learners to engage with abstract concepts such as strategy and cause-and-effect relationships, applying these in concrete problem-solving situations. The sociocultural perspective (Vygotsky, 1978) further explains how scaffolded guidance from teachers and collaborative interactions with peers enable learners to operate within their Zone of Proximal Development, achieving cognitive and social outcomes beyond what they could accomplish independently.

Chess also emerged as a tool for promoting active participation, particularly in large or resource-constrained classrooms. Learners who were typically passive became more engaged, and differentiated instruction through chess enabled high-achieving learners to be challenged while struggling learners received targeted support. These findings reflect principles of active learning and inclusive pedagogy, which emphasize learner choice, autonomy, and collaborative engagement as

essential for effective education (Piaget, 1972; Vygotsky, 1978). By enabling learners to make decisions about activities, chess appears to strengthen intrinsic motivation, consistent with self-determination theory (Deci & Ryan, 2000), which links autonomy and competence to enhanced engagement and learning outcomes.

The study highlights the role of enjoyment and gamification in sustaining engagement. Teachers reported that associating learning with chess created anticipation and excitement, motivating learners to complete academic tasks and participate fully. Even learners who had previously shown little interest in conventional classroom activities became attentive and involved. This is consistent with research emphasizing the value of play and gamification in early learning, where enjoyable and meaningful activities enhance attention, retention, and positive attitudes toward school (Prensky, 2001). In this context, chess serves a dual function, bridging play and formal learning while promoting cognitive, social, and emotional development.

Concentration and self-regulation were additional areas where chess had a measurable impact. Teachers observed that learners became more patient, deliberate, and attentive over longer periods. Previously inattentive or disruptive learners demonstrated improvements in behaviour, focus, and perseverance. Such outcomes align with the literature linking cognitively demanding games to enhanced executive functioning, including working memory, attention control, and self-regulation (Burgoyne et al., 2016; Sala & Gobet, 2016). These findings further support the notion that structured, rule-based activities, such as chess, can cultivate essential skills for academic success and personal growth, particularly in early childhood.

While the study demonstrates substantial benefits, several limitations must be acknowledged. The sample size was small and restricted to a single district, which limited its generalizability. Additionally, the research relied on self-reported data from teachers and programme facilitators, which may be subject to bias. Longitudinal effects of chess on academic outcomes were not measured, and comparisons with alternative instructional tools were not conducted. Future research should incorporate larger, more diverse samples, longitudinal designs, and mixed methods to capture both quantitative learning outcomes and qualitative experiences. Research in under-resourced and rural contexts is particularly needed to determine the replicability and sustainability of chess interventions.

The study provides strong evidence that chess can function as a low-cost, engaging, and pedagogically valuable tool in early childhood education. By fostering cognitive skills, concentration, active participation, and social-emotional development, chess contributes to the holistic growth of learners. These findings support calls for innovative, context-sensitive strategies in resource-constrained classrooms and demonstrate how non-traditional educational tools can complement standard curricula to improve learning outcomes.

Limitations

This study has several limitations that should be taken into account when interpreting the findings. First, the sample was relatively small, consisting of sixteen participants from a single district in KwaZulu-Natal, which may limit the generalizability of the results to other regions or broader populations. Second, the study was conducted exclusively in rural, under-resourced classrooms, which means the findings may not fully reflect experiences in urban or well-resourced schools, where learning environments and available support differ. Third, the research relied primarily on self-reported data collected through interviews and questionnaires. While this approach provided rich qualitative insights, it may also introduce subjective bias, as participants could present socially desirable responses or selectively recall experiences. Additionally, the study focused on the short-term integration of chess into classroom activities and did not track long-term outcomes, leaving questions about the sustainability and enduring impact of chess on learner engagement, motivation, and academic performance. Finally, while the study explored the perspectives of teachers and coordinators, the voices of learners themselves were not directly captured, which could have provided additional insight into the effects of chess on early childhood learning.

Implications for Curriculum and Teaching Practice

The findings suggest several practical implications. First, integrating chess into the Foundation Phase curriculum can enhance the quality of education by providing a structured, enjoyable, and intellectually stimulating learning environment. Second, teacher training is essential to ensure that facilitators are confident in delivering chess-based activities and can adapt them to meet the needs of diverse learners. Ultimately, the study underscores the potential of chess to foster inclusive learning, enhance classroom management, and cultivate life skills that transcend the academic domain.

Recommendations

This study reveals that incorporating chess into early childhood education has significant benefits. Chess improves learner participation, concentration, behaviour, and attendance while providing teachers with an engaging and effective teaching tool. It is recommended that:

1. Teacher training should be strengthened so that facilitators feel more confident in their own chess skills.
2. Programme expansion should be considered for earlier grades, including Grade R, to instil concentration and discipline from the start.
3. Policy support should be provided to integrate chess into curriculum strategies as a formalised tool for learner development.

Chess offers a practical, low-cost, and impactful way to enrich early childhood education. Moves on the chessboard, when translated into the classroom, become moves that truly matter for learners' growth and success.

4. CONCLUSION

This study demonstrates that chess, implemented through the Tsogo Sun Moves for Life (M4L) programme, is an effective, low-cost, and practical learning strategy for enhancing education in rural South African primary schools. Findings from interviews with teachers and other stakeholders indicate that chess enhances motivation, concentration, and active participation among early childhood learners, while also fostering social skills such as cooperation, patience, discipline, and resilience. Chess contributed to creating more inclusive, interactive, and supportive classroom environments.

The study strengthens the literature on inclusive pedagogy by providing empirical evidence that chess can holistically support both cognitive and social-emotional development, particularly in resource-constrained contexts. Chess was shown to enrich curriculum delivery and offer meaningful learning experiences for all learners. The study recommends integrating chess as an innovative approach in early childhood education and highlights the need for further research on its long-term effects and the direct perspectives of learners.

ACKNOWLEDGEMENTS

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