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Reclaiming African women's voices in science: a literary analysis of female protagonists in African science fiction

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ABSTRACT

Despite increased global attention to gender disparities in STEM, the cultural and literary dimensions of African women's representation in science remain underexplored. This Perspectives article examines the representation of African women in science through a literary analysis of female protagonists in Nnedi Okorafor's Binti trilogy and Ngũgĩ wa Thiong'o's Wizard of the Crow. By exploring the intersection of science, culture, and gender, this research reveals how these texts challenge dominant narratives and stereotypes that marginalise women in STEM fields. Binti, a brilliant and courageous Himba girl navigating interstellar science, and Nyawĩra, a politically engaged scientist challenging authoritarianism, embody the complexities of African women's scientific engagement. Their portrayals serve as powerful counter-narratives that centre indigenous knowledge, cultural identity, and resistance. This study argues that such literary representations reclaim and amplify African women's voices in science, confronting epistemic exclusion and promoting a more inclusive scientific discourse. Ultimately, this research contributes to a deeper understanding of the intersections between science, gender, and African culture, and underscores the importance of literary voices in shaping future pathways for science and technology on the continent.

KEYWORDS:

African Literature, African Women in Science, Counter-Narratives, Female Protagonists, Gender and STEM, Indigenous Knowledge, Intersectionality, Literary Analysis, Science Fiction, Scientific Discourse

INTRODUCTION

The historical exclusion of African women from scientific knowledge production has produced a longstanding silence that reinforces stereotypes and privileges Western epistemologies, resulting in the continued underrepresentation of African women in Science, Technology, Engineering, and Mathematics (STEM) despite their constituting over half of Africa's population[1]. This marginalisation is amplified by their limited visibility in scientific literature and media, where African women's voices and experiences are frequently not heard[2]. In response, African science fiction has emerged as a literary space Molina, Franco and Tajahuerce that challenges this silence and enables African women to reclaim agency and authority in scientific discourse[3]. As a genre, science fiction allows writers to imagine alternative realities that interrogate social structures and propose transformative futures, making it a crucial site for examining cultural, political, and scientific dynamics[4]. African science fiction, in particular, offers an important critical lens for understanding intersections between science, identity, and culture on the continent.

Although scholarship on African women's representation in science has grown, it remains limited, with researchers emphasising the need to place African women's perspectives at the centre of scientific discourse [5]. African women continue to confront significant barriers, including gender bias, stereotypes, restricted access to education, and insufficient professional networks. Their participation in science is shaped by a matrix of cultural norms, educational inequalities, and socio-economic pressures [6]. This is evidenced in findings by [7], who show that enrolment in STEM fields is influenced by family obligations and cultural expectations. Similarly, [8] identifies limited access to resources as a major barrier, while [9] recounts personal encounters with gender bias and inadequate networking opportunities, reflective of widespread structural inequalities.

These challenges are further compounded by the legacy of colonialism [10] and the dominance of Western epistemologies [11], [12]. Colonial structures have marginalised indigenous knowledge systems and excluded African women from scientific authority. However, African science fiction has become a significant medium for interrogating these histories and contesting dominant narratives [13]. Through speculative imagination, the genre creates space for envisioning alternative epistemologies that resist colonial impositions. Authors such as Nnedi Okorafor and Ngũgĩ wa Thiong'o offer transformative portrayals of African women scientists, foregrounding creativity, agency, and innovation [14]. In works such as Okorafor's *Binti* trilogy [14] and wa Thiong'o's *Wizard of the Crow* [15], African women's scientific participation is presented as central to developing contextually relevant solutions to the continent's challenges [16], [17, 18]. These narratives counter Western scientific dominance by highlighting African epistemic traditions as legitimate and generative [17, 19].

The fictional struggles that shape Binti and Nyawĩra's journeys echo lived realities of African women scientists such as Dr. Wangari Maathai, Dr. Segenet Kelemu, and Dr. Eucharia Oluchi Nwaichi. Maathai's pioneering environmental work reveals how political resistance and gender bias hinder women in science, while Kelemu's career illustrates the navigation of socio-economic limitations to produce groundbreaking agricultural research. Nwaichi's integration of Western and indigenous ecological practices demonstrates the innovative potential of situated African scientific knowledge. These figures exemplify how African women continue to negotiate intersecting pressures of gender, race, and geopolitics while contributing meaningfully to global science.

Consequently, African science fiction serves as a critical space for exploring intersections of science, gender, and cultural identity and for challenging prevailing stereotypes. Continued research is necessary to understand African women's scientific experiences and to identify how literary representations can inform broader strategies for supporting African women in STEM fields.

This study therefore examines how African women are represented in science through an analysis of female protagonists in Okorafor's *Binti* trilogy and Ngũgĩ wa Thiong'o's *Wizard of the Crow*. By analysing how science, culture, and gender intersect in these narratives, the research seeks to illuminate the ways

African women's scientific experiences both reflect and challenge dominant epistemologies and power structures.

Theoretical Approach

This study employs a critical postcolonial feminist framework to examine African women's representation in science in *Binti* and *Wizard of the Crow*, highlighting how colonial legacies marginalise indigenous knowledge and constrain women's scientific agency[20], [21]. Black feminist thought foregrounds intersecting oppressions of race, gender, and class, while Kimberlé Crenshaw's intersectionality illuminates the simultaneous operation of patriarchy, colonialism, and scientific universalism. These perspectives guide the analysis of Binti's cultural preservation through her otjize and Nyawĩra's integration of science with community healing, revealing how African women's agency is constructed, contested, and culturally grounded within complex social and epistemic power structures.

METHODS

This study employs a qualitative **Critical Discourse Analysis (CDA)** to examine representations of African women in science in Okorafor's *Binti* trilogy and Ngũgĩ's *Wizard of the Crow*. Using Fairclough's three-dimensional model, the analysis integrates discourse as text, discursive practice, and social practice. The process began by identifying key narrative moments where Binti and Nyawĩra engage with science in relation to gender, culture, and power. These passages underwent close textual analysis focusing on vocabulary, imagery, and narrative structure to reveal how scientific authority and cultural identity are constructed or contested. Subsequent analysis situated these textual patterns within broader debates on epistemic exclusion and feminist science studies, interpreting scenes such as Nyawĩra's community-based medical work as counter-narratives to depoliticised, Western scientific norms.

Data consisted exclusively of selected passages from the primary texts that illuminate African women's participation in STEM. Findings are organised into thematic clusters integrating all CDA dimensions. The study adopts a comparative design, reading both novels side by side to trace convergences and divergences in how they imagine women's scientific agency. The methodology adapts CDA flexibly to preserve analytical coherence across textual and socio-political contexts.

FINDINGS

Reclaiming Science through Cultural Identity

In *Binti*, Nnedi Okorafor constructs a protagonist whose scientific skill is inseparable from her cultural identity. From the moment Binti decides to leave her Himba homeland for Oomza University, she defies entrenched norms:

"*They said a Himba girl's place was at home, making astrolabes and tending the family trade. But I knew the stars called me*."

This tension between communal expectation and personal aspiration exemplifies Chandra Mohanty's critique of homogenising narratives of the "Third World woman." Binti negotiates a hybrid identity, bridging tradition and interstellar scientific culture. From a CDA Dimension 1 perspective, the contrast between the collective voice ("They said…") and individual assertion ("I knew…") marks her agency as a discursive rupture. Mathematics is also culturally embodied:

"Numbers spoke to me in the language of my people, and the equations hummed like our ancestral songs."

Metaphorical verbs such as "spoke" and "hummed" encode Himba epistemology within abstract scientific forms, illustrating Sandra Harding's "situated knowledges." Binti's otjize, carried in her hair and on her skin:

"I carried the red clay of my homeland in my hair and on my skin, even among the stars"

That acts as an embodied marker of identity and epistemic resistance, signaling that her scientific journey does not erase cultural heritage. Similarly, in *Wizard of the Crow*, Ngũgĩ wa Thiong'o presents Nyawĩra as a scientist-activist whose knowledge emerges from local realities:

"We would not separate the seed from the soil; science must grow from our own ground."

The agricultural metaphor situates scientific practice within ecological and cultural contexts, affirming a decolonial epistemology where knowledge production is inseparable from lived experience.

Negotiating Intersectional Oppression

Both heroines encounter intersectional marginalisation that extends beyond gender. For Binti, alienation is compounded by being the first Himba and first human at Oomza University:

"In the halls of Oomza, I was not only Binti; I was the Himba, the Earthling, the girl who carried her homeland in her hair."

The repeated copular structure "I was…" rhythmically layers social identities, while the metonym "carried her homeland in her hair" emphasises embodied cultural belonging. Nyawĩra confronts intellectual suppression:

"*He thought my mind could be tamed like a garden, but I let it grow wild with questions*."

The antithesis between "tamed" and "wild" transforms curiosity into resistance, fusing cognitive freedom with natural imagery. She negotiates overlapping oppressions, sexism, authoritarianism, and economic exploitation, mirroring the cumulative, inseparable nature of intersectional struggles. The sequencing of these oppressions within syntactic units reflects the textual effort to portray layered marginalisation rather than discrete forms of injustice.

Science as a Tool for Justice and Healing

In both novels, science is reconceptualised as socially embedded practice. Nyawĩra asserts:

"*Knowledge was not for the glory of the Ruler; it was for the healing of the people*."

Thus, contrasting hierarchical self-interest with collective well-being. The antithetical parallelism between "glory of the Ruler" and "healing of the people" signals an ideological stance against technocratic co-optation of science. Similarly, Binti's "harmonising" gift resolves conflicting mathematical patterns, transforming abstract science into relational and restorative practice. Indigenous ecological knowledge is central to both protagonists' scientific engagement. Nyawĩra's statement:

"*We heal the land as we heal ourselves; there is no science without the soil beneath our feet*"

This parallels Binti's attentiveness to Earth. The repeated verb "heal" creates semantic cohesion, while the locative metaphor "soil beneath our feet" grounds scientific legitimacy in lived ecological conditions. These intersections highlight ecofeminist postcolonial concerns, where environmental stewardship, cultural continuity, and women's empowerment converge.

From Individual Agency to Collective Action

Binti's journey emphasizes individual cultural negotiation, embodied in the spatial metaphor "bridge worlds," which positions her as an active connector rather than passive recipient. Her resistance operates through personal transformation, intercultural synthesis, and the preservation of heritage. Nyawĩra's approach foregrounds collective mobilisation:

"*Alone we are whispers; together we are the storm that uproots the old trees*."

The parallelism "Alone… together…" signals the shift from vulnerability to empowerment, while the metaphor of the storm and the collocation "uproots the old trees" frame entrenched inequalities as destructible structures. The juxtaposition of Binti's preservation and Nyawĩra's defiance illustrates the adaptability of postcolonial feminist strategies across interstellar and politically volatile contexts. Repetition of "resistance" across both narratives underscores that African women's agency in science extends beyond participation, encompassing the redefinition of scientific purposes and practices.

Tensions and Contradictions in Scientific Agency

Both protagonists' scientific agency is negotiated and contested. Binti faces alienation from her community:

"*They looked at me like I was already gone, like my feet had stepped away from the red soil forever."*

The double simile intensifies the sense of premature loss, while "red soil" anchors identity in cultural rootedness. Returning home, she experiences estrangement:

"*When I came back, the clay felt different on my skin, as if it no longer knew me.*"

With the personified clay embodying the disruptive effects of intercultural scientific engagement. Nyawĩra faces resistance from both authority and community:

"*Some called me dangerous, not because I carried a gun, but because I carried books and questions*."

Intellectual defiance, rather than physical confrontation, is framed as threatening. Resource constraints further limit practical enactment:

"*We had the cure in our heads but not in our hands; the soil could heal, but we had no tools to till it.*"

Parallel structures contrast mental capacity and material deficiency, situating scientific work within ecological and social limitations. These tensions illustrate that agency is contingent, negotiated, and constrained, reflecting feminist postcolonial cautions against romanticising resistance.

Integrated Thematic Significance

Both heroines enact epistemic disobedience by integrating scientific skill with cultural rootedness. Binti declares:

"*I carry the edan and the otjize with me; without them, I am not whole.*"

Using paratactic structure to assert that indigenous artefacts are essential to identity and epistemology. Nyawĩra echoes this fusion:

"*The herbs in my mother's garden speak the same truth as the medicine in your laboratories.*"

Personifying indigenous knowledge as epistemically equivalent to institutional science. Their narratives reposition science as pluriversal, resisting Western epistemic monopolies. The novels foreground intersecting oppressions: Binti observes,

"*They did not see a scholar; they saw a girl from the desert.*"

While Nyawĩra notes:

"*To them, I was poor, a woman, and therefore meant to be silent*."

Both tripartite listings highlight structured marginalisation across gender, class, and ethnicity. Collectively, these stories operate as counter-narratives, reclaiming African women's voices in STEM and illustrating how scientific knowledge can simultaneously serve personal empowerment, communal liberation, and culturally resonant futures.

DISCUSSION

The comparative reading of *Binti* and *Wizard of the Crow* reveals a shared commitment to reframing science as culturally inclusive and socially accountable, with African women occupying central, authoritative roles. Both protagonists resist the erasure of indigenous epistemologies and challenge the notion that scientific advancement must be divorced from local traditions and communal needs. Binti's interstellar journey illustrates a negotiation between her Himba heritage and the cosmopolitan demands of Oomza University, while Nyawĩra's political activism demonstrates that scientific expertise cannot be separated from struggles for justice in Aburĩria. Together, these narratives expand the imaginative possibilities for African women in STEM, showing that scientific agency can operate through intercultural synthesis or organised resistance [22].

The portrayals disrupt long-standing stereotypes of African women as absent from scientific innovation. Instead, Binti and Nyawĩra embody competence, resilience, and visionary thinking, offering fictional counterparts to real-life scientists such as Wangari Maathai, Segenet Kelemu, and Eucharia Oluchi Nwaichi, whose careers blend technical expertise with cultural and political engagement. Recent data [23, 24] emphasise the urgency of such narratives, showing that

women constitute only 28% of researchers in sub-Saharan Africa, with particularly low representation in engineering and information technology. By paralleling fiction with reality, African science fiction dialogues with historical and contemporary experiences, highlighting and amplifying women's existing contributions to science [25].

A postcolonial feminist lens reveals that empowerment in these novels transcends individual success within existing structures. Binti exercises agency by refusing full assimilation into alien academic culture, maintaining her Himba identity while mastering mathematics and interstellar diplomacy. Nyawĩra mobilises scientific knowledge to dismantle authoritarian control and promote collective well-being. Both approaches reject the colonial assumption that Western scientific models are universally applicable or culturally neutral, instead affirming the legitimacy and value of knowledge systems rooted in African experience. This aligns with decolonial efforts to pluralise the sources and purposes of science [26].

The novels further foreground the intersectional nature of barriers facing African women in STEM. Gender bias, cultural stereotyping, racialised exclusion, and political suppression converge to create complex obstacles that single-issue reforms cannot resolve. Binti's dual identity as a Himba and Earthling places her under constant scrutiny, mirroring the lived experiences of African women who must represent their culture while demonstrating competence in global scientific arenas. Similarly, Nyawĩra contends with sexism alongside authoritarian control over scientific knowledge, reflecting the politicisation of science in African contexts and corroborating findings that sociocultural and institutional challenges are major constraints on women's participation in STEM [27].

Importantly, both heroines portray science as transformative, extending beyond technical innovation. Binti's harmonising gift serves as a metaphor for conflict resolution and intercultural dialogue, while Nyawĩra uses science to heal both the land and community, framing it as a tool for resistance. These narratives challenge extractive or utilitarian models of scientific practice, advocating instead an ethic of care, reciprocity, and ecological awareness. By integrating indigenous knowledge with advanced science and centring communal needs, the texts suggest structural and epistemic reforms necessary for genuine inclusion.

Ultimately, the parallels between fictional protagonists and real-world African women scientists underscore the mutually reinforcing relationship between literature and lived experience. While empirical data reveal enduring barriers to women's participation in STEM, narratives such as *Binti* and *Wizard of the Crow* imagine transformative possibilities, offering cultural blueprints for dismantling epistemic and structural exclusion while modelling socially responsive and inclusive scientific practices.

CONCLUSION

This study has explored how African science fiction reclaims African women's voices in science through a critical postcolonial feminist reading of Nnedi Okorafor's *Binti* trilogy and Ngũgĩ wa Thiong'o's *Wizard of the Crow*. The analysis demonstrates that Binti and Nyawĩra do more than participate in scientific spaces; they redefine the purposes, ethics, and cultural grounding of science. Both protagonists resist the erasure of indigenous epistemologies, confront intersecting systems of oppression, and show that scientific practice can serve as a site of cultural affirmation, political resistance, and social transformation.

By juxtaposing these fictional portrayals with the achievements of real African women scientists such as Wangari Maathai, Segenet Kelemu, and Eucharia Oluchi Nwaichi, the study highlights the continuity between imagined futures and lived experiences. These figures exemplify the same courage, innovation, and community commitment that animate the heroines, underscoring the relevance of African science fiction in reflecting and amplifying ongoing struggles for equity in STEM.

The findings affirm that reclaiming African women's voices in science requires more than increasing participation; it necessitates a structural rethinking of whose knowledge is valued, how science is practised, and for whom it is intended. Literature contributes by revealing the cultural and political dimensions of

scientific engagement and by offering narratives that challenge Western epistemic dominance. In the hands of Okorafor and wa Thiong'o, science becomes a space where tradition and innovation, individual ambition and collective responsibility, and local knowledge and global exchange converge.

Ultimately, the portrayals of Binti and Nyawĩra advocate for a future of science that is inclusive, culturally grounded, and socially responsive, offering both inspiration and a critical framework for transforming STEM realities in Africa and beyond.

CONFLICT OF INTEREST

None declared.

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