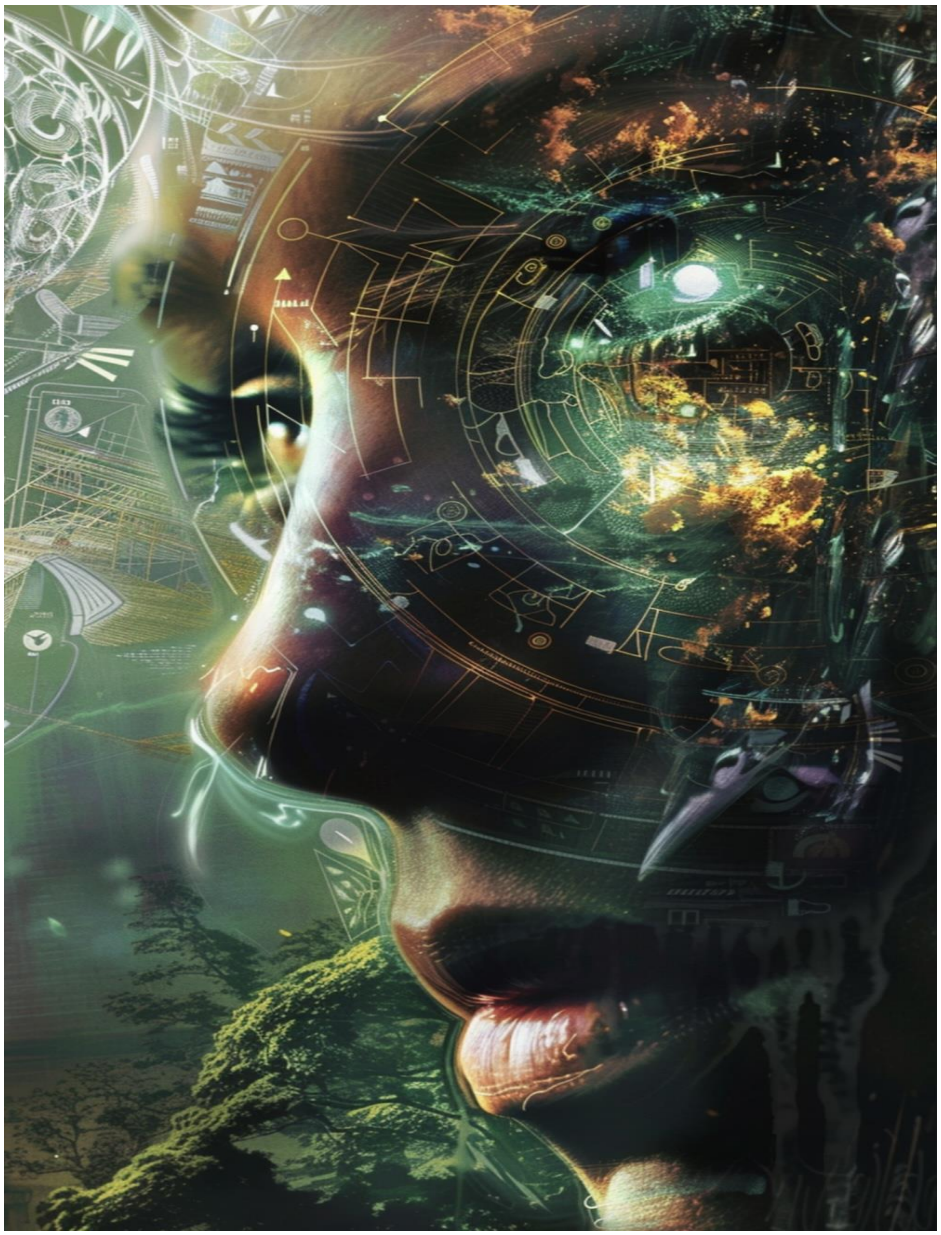
WritingThreeSixty

Journal of Research and Creative Texts



Volume 7 Issue 1

The Artificial Intelligence Special Issue 2024: Relaunch of *WritingThreeSixty*

University of the Western Cape

Letter from the Editor

Dear readers, I present the first issue of *WritingThreeSixty* for 2024. It has been exciting work as the newly appointed Editor-in-Chief working alongside the new Editorial Board and producing this issue since the journal's hiatus after the previous issue as a result of the Covid pandemic. The Editorial Board of *WritingThreeSixty* were overwhelmed by the support from our readers and the writers who have previously published their works in this journal which made this relaunch successful.

The new Editorial Board has put together a collection of articles that respond to the theme of this issue, namely, the influence of Artificial Intelligence (AI) in transforming the world of academia, scholarship, and the arts. Responses to the call for papers for the AI Special Issue interestingly show that most writers chose poetry as the medium used to respond to the theme for this issue. This issue also features other creative works and academic articles from talented writers across Africa.

I hope you find it a pleasure to read the AI Special Issue Volume 7 Issue 1 and to participate in the conversation *WritingThreeSixty* is having with African creators, academics, and audiences abroad on the current issue.

Best Wishes,

Editor-in-Chief
Peter Oyewole Makinde

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About the Journal

WritingThreeSixty is a bi-annual, interdisciplinary journal for research essays and creative works. First launched in 2014 as an initiative of the English department at the University of the Western Cape (UWC), *WritingThreeSixty* now forms part of the broader community within the Arts Faculty and Humanities at UWC. This journal maintains the standard of peer review and wishes to provide a platform to develop a culture of publishing among postgraduate and emerging students, as well as established creative artists within UWC and South Africa at large.

WritingThreeSixty also forms part of co-curricular graduate culture at UWC that affords students the opportunity to develop professional skills through the voluntary leadership and service positions created through the journal. These positions include the management of the journal and its team, editorial outputs, as well as our digital marketing efforts that are presented through social media and our online website.

POETRY

From the collection, 'This House', *This Pink Suitcase* by Owam Heyana

This pink suitcase
with wheels that wiggle in different directions
and is as big as if it could fit the world in it
was bought for my travels.

Its pink leather always catches my attention
as it stands against my white bedroom wall.
I imagine its small outer
compartment just above the big one keeping safe
my return ticket.

But now it fits my brother's clothes,
his spider-man onesie and new soccer kit,
his favorite sneakers and new winter jacket.

His mother's picture,
where she has short hair and a small pregnant belly.

This pink suitcase
now fits his new life.

Old and Broken things **by Owam Heyana**

I want to tell you that when I lay on this bed,
facing this white wall, it feels like there are
spirits in me that have not been laid to rest.
It feels like in my chest lives stories that aren't
mine to tell. Like it has been stuffed with only
old and broken things, things that aren't mine
to keep or hear. But I don't know how when
you only seem to love the half to my whole.

Our Hope **by Owam Heyana**

The drain has burst, the water has flooded our roads and
the municipality hasn't come to fix it.
Our cars have found way into potholes so deep they could bury us.
We watch cars getting hijacked and clutch our purses to our chests.

We don't fight, scream, we just watch.

We have cast our hope to the school children crossing
the road without a crossing patroller.
We are giving them a country where no home can stand,
as though we believe the best we can do is 'lay on [our] backs.'

***Last night* by Owam Heyana**

Last night I danced,
I cannot dance.
Or rather I can
but I am terrible at it.
I danced to the songs I was listening to.
I was a ballet dancer
for the most part –
all poise no posture,
all shaking no steadiness

But it was freeing

I smiled in those moments
more than I
did during the day.

I was halfway to myself.

I wonder what do you want from me? by Menzi Thango

Do you really know me?
Because we don't know each other.
So –
What do you want from me?

Fighting a total stranger?
What do you want, young man?

What did I ever take from you?
What makes you think I owe you anything?
Because we don't know each other.
You heard about me –
I also heard about you –
I am not even interested in knowing you.
I don't hang out with small boys like yourself,
You're just a dude!

You make real men lose in the game –
I mean the dating game.
You play with girls' hearts,
You're such a player.
An obscene boyfriend.

You were playing with girls
Changing them like socks,
Thinking you are smart,
Thinking you are not condemned –
And here you are, condemned.
And you are doomed
    Like a pile of coins
    That do not have buying value.
You're such a fool –

A nincompoop.
I wonder who your parents are,
What are they really saying about you?
Do they say they gave birth to a young man?
They are really deceiving themselves.

Great voices, loud sounds by Menzi Thango

I hear voices –
Unknown voices,
    But great ones
    Coming from all directions.
Sounds of waves
Sounds of trees:
    Baobab trees
    Willow trees.

I hear ancestral voices.
    Calling my name
    Calling me on all sides of earth
O I am shivering;
Thinking out loud:
    Should I go or not?
What will I be without my calling?

I see grannies.
    Working tirelessly;
    Working together.
I see my great-grandfathers.
    Calling my name;
    Commanding me;
    Shouting at me harshly;
    Sending me to the field;
    Giving me instructions.
Giving me messages:
    Messages of hope;
    Messages of life.

I see and I see …
Yes, I see Thee in my dreams,

Heavenly dreams I see,
In ancestral land I live.
I live to see more;
More of myself
Through this great land of my forefathers
I keep seeing my twin,
Oh yes, my twin;
Coming to me whispering:
Come, come closer!
Let’s go and work;
The time has come.

I see a long queue.
The longest of all I’ve ever seen.
I see the young ones,
I see the old ones,
I see everyone.
Longing for help
With the hope to be healed.
Now they are healed,
Now they are helped.
By the great ancestors of the land.
The land of the gracious,
The land of the Ntu family.

The life of an academic by Menzi Thango

What a lonely life;
Men and women married to a special kind:
A book.
Reading, writing, and critiquing
Loneliness at its best
Living in one's own land.
Land full of pages.
Pages full of directions
Unending directions
Researching, researching and until research.
No-one stops,
But different stops;
No agreement,
But arguments;
Saying one thing
In a different word choice.

He is not a human.
He is an object.
Working tirelessly like a machine.
A machine without fuel;
A human without blood.

Working tirelessly
Through sleepless nights,
An article is required.
Publications are required.
Supervision of postgrads is required.
Lecturing is required.
Setting question papers is required.
Marks are required.
Energy is required.

Everything is required of one person.

But no earthly reward after all.

Do academics relate to real life?
Do they believe in family values?
What kind of a family?
Western family?
African family?
Oh no! Westernised family of course,
No African ethos in academia,
Either Western or no life,
This is the life we see today.
What is an academic actually?
A human being or a robot?
Does he have feelings?
Does he have emotions?
Does he feel pain?
Does he live?
Where does he live?
In his own land?
Or shared land with humans?
I wonder.

Code by Zongezile Matshoba

I am code
No, not cold by code
I code to decode
Thought and consciousness are my forte

I don't exist, you think
My end product does
Leaving many wowed with wonder
Some doubting and skeptical

I change the thinking
I change the look
I change the manner of executing
At a speed of light, sometimes

I am loved
For doing things in my own way
I am hated
For my productivity seems threatening

I am open to suggestions
I am flexible and user-friendly
Fear not of the unknown
I already know it

Dead Battery by Zongezile Matshoba

It was a cold day
The car refused to start
Somebody shouted ‘Kick-start it!’
A neighbour came to inject some momentum
‘Push!’ We energised everyone
Vroom, the child played with invisible steering
‘Release the hand-break!’
The exhaust seemed exhausted
The battery had died
The bonnet was opened
‘Check the negative and positive’
‘How does a battery die?’
The little one asked crying
A bot giggle came from the bonnet
It sounded like …
The child laughed
The car was idling
They all drove off

Co-di-ng by Jerome Coetzee

I may look like a minute taker
A pen ticking on my fingers
Pages turning from my notebook
Ideas becoming volcanic

Your ways of always being busy
Forever laughing loud on the phone
Glued on Facebook, WhatsApp and Tik Tok
It is poetic service

Your shouting and gesturing
Faking hide-and-seek
The passage your strolling stage
All dramatic rehearsals

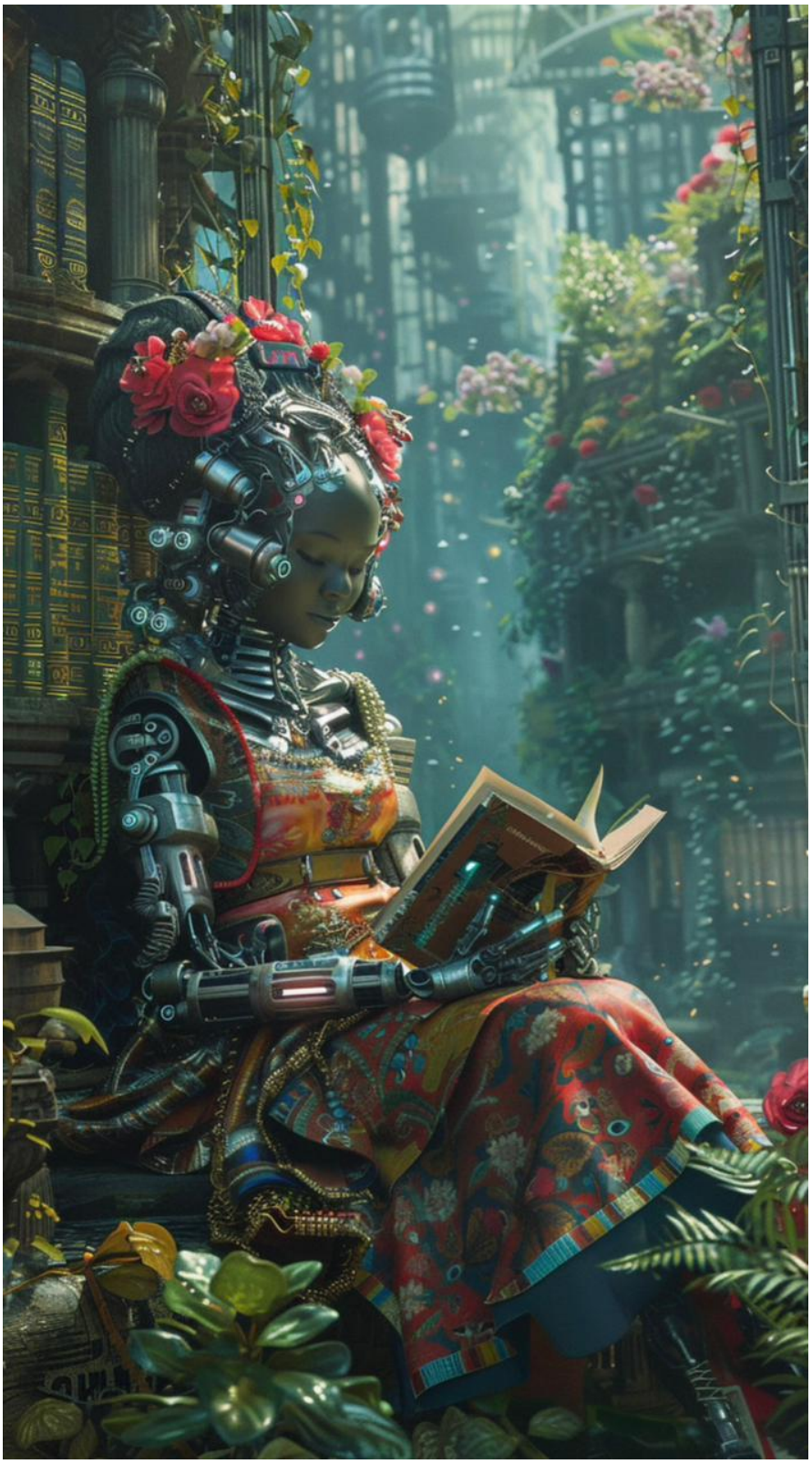
Your narration of misplaced documents
You struggling to get hold of a citizen
Taking 360˚ break times
Are all artificial requiem

At a press of a button
A voice or eye contact
I oblige to commands
Easing livelihood

Witchcraft by Jerome Coetzee

To many it was witchcraft
Sangomas knew it as haunting
Funny people invented magic
Schizophrenia said the medics
The religious saw a possessed
The end was near for the indigenous
The futurists searched all engines

You were talking alone
The radio frequency was dancing
The television played pictures
The phone spoke with answering machine
Tick-tock, tick-tock until you asked what's up
Smartphones socialising everyone with booked faces



By Charne Williams **(charnewilliams01@gmail.com)**

CREATIVE NON-FICTION

Technical Support at the Writing Center by Anna Nguyen

I am a writing instructor at a local university, where undergraduate students make appointments with me to help with their paper writing. The writing center is a kind of drab smart room that isn't very smart. The lights are designed to detect motion, but we're all sitting and staring in front of the computer. The lights turn off in the middle of a discussion. It is rare for a wave of my arm to alert them to flicker back on.

The students come to the writing center from various classes. Engineering, literature, public health, art history, science labs, nursing. Some students have drafts, some have outlines, some need guidance to begin. Many of them are overwhelmed, unsure where to start. Others seem guarded or there is an air of defensiveness as they intone the reason why they have made an appointment.

When I began my position four months ago, one of my first appointments was with a student from a STEM program. He had an enthusiastic, radio voice, which jolted me from my sedentary slumber on an early Friday morning. He booked an appointment for two hours, on citational formatting. If we had time after the lesson, he would move on to work on small sentence-level edits. Two hours that merely focused on citation seemed excessive, but I followed the student's goals.

The student pulled out his crumpled paper and located the final page. I quickly scanned the references. They weren't alphabetized and the student had only listed links. I couldn't discern what citation style he was using and inquired if his instructor taught him how to cite. He laughed and offered a negative answer.

He and I scrutinized every reference in his bibliography. They were mostly websites with content that I, as an instructor, would discourage students from using as primary research. Rarely did we find an author to cite. Nor were there dates, nor page numbers.

But I'm not his instructor, so I held my tongue.

The student marveled at the different components necessary for citing a government website, for an online essay, and from an academic blog. We moved onto his in-text citations, to match his updated bibliography. I saw the student's low grade and inquired how his instructor had graded his assignment. The instructor had used Turnitin, the student responded. Surprised by my blank expression, he further elaborated on the AI-powered software, explaining that the

instructor had used it to detect plagiarism. He admitted he had copied and pasted links but hadn't realized the seemingly innocuous decision constituted plagiarism.

It doesn't, I assured him. Or, rather, I corrected myself, it shouldn't in this case. An article posted by the National Library of Medicine pointedly emphasizes that Turnitin is a software that considers a "similarity index". But his professor had used it to specifically look for plagiarism and used the software's percentage to significantly reduce the student's grade.

For the next fifteen minutes, the student and I look at the other two comments, unrelated to citations. In the margins, the instructor had raised a broad concern on the student's syntax in his abstract. The other comment advised him to make an appointment at the writing center.

I helped the student revise some of his fragments, the only ones noted by the instructor. I also encouraged the student to restructure some of his sentences.

"Do you feel good about the edits, the revision?" I asked the student. The question is one that I will constantly pose to students toward the end of their appointments.

He affirmed, praising the revised paragraph as one of the better things he's written.

We didn't use the full two hours, and I noticed the student was feeling restless. We've responded to all of his instructor's comments, yet we could have revised more where there were unnoted concerns of fragments and run-on sentences. But I chose not to push. It was his paper, his appointment.

After cheerily thanking me, he left.

This student does not actually exist. He is a composite of the students I've tutored over and over again in the writing center.

~

The labor of professors and instructors, adjunct or not, has long been a structural issue in universities. The workload is simply not commensurate with the pay expected from course design and implementation. I try to sympathize, but I am also aware of instructors who continue to perform the role of The Professor despite the ails of the university. The Professor who designs demanding coursework on assumed skills that are not taught in class. Something as seemingly simple as formatting citations is a skill The Professor requires. And so the students turn to AI text generators to help them write their bibliographies, a sign of defeat. Another student from an English class used ChatGPT to summarize a reading they didn't understand. I have never used ChatGPT, but my curiosity is focused on the reason why the student felt the need to use it at all.

Technologies are fallible tools. They cannot detect inconsistency, and they are certainly not designed to be editors or readers. When I make a remark that the students should contact their professors and instructors for clarity, they reveal details that point to pedagogical decay. Their classes are online, many of them recorded lectures that do not require attendance. Their instructors do not respond to emails. Their resources are in the form of video tutorials. This image of such a classroom design is not a new, disruptive force; technology has always been a strong presence in all universities. And it's not surprising that technology has become the student's last, dependable resort. At least these technical entities are responsive.

Yet, the students have also learned that their minor mistakes are largely caused by using AI tools.

When they come into the writing center, they are given a chance to resubmit to improve their grade. Most of my appointments begin with a litany of complaints. Somewhere in their complaints, I hear something resembling unfairness and an awareness of failure somewhere. They do not vocalize a person to blame, cannot quite pinpoint what is the problem, and their angry distinctions are quite vague. But there are similarities across the different classes from different disciplines and programs. I collect and analyze in silence. The students need a quiet, sympathetic listener. But the patterns will always emerge.

These Professors send their struggling students to the humble writing center, where I've become a kind of expert, one who has learned to read and understand terse rubrics with high expectations and to translate instructor's feedback into possible revisions. I've learned to read hasty drafts and encourage the students to be in dialogue while I try to understand their research. When I turn on the suggesting mode and see their panicked faces at my comments, I've learned to tell them as kindly as I can that my notes are merely notes, that they can and should reject any suggestions I make. I've learned to be supportive when I see the students at their breaking point.

It is mandatory for nursing students to make an appointment at the writing center. I have to send a report of my appointment to their instructors, as proof that they've completed an assignment. I have read enough nursing drafts to understand recurring medical topics and debates, a common language that helps me interact with them. I've learned to quickly sketch an outline for the students based on their papers. For their annotated bibliographies, I make a template following their professor's examples. Paragraph one, summary. Paragraph two, overall thoughts on author's work and address strengths and limitations. Paragraph three, how they will use the article in their own work. They eventually catch on to the pattern and they can move forward once our hour is up.

They just need a formula, to help them translate jargon and jumbled thoughts into paragraphs for an eight-page research paper. They need someone to ask them how they might summarize a peer-reviewed paper. They only need a little writing guidance.

An AI tool cannot help the student with this without sounding robotically formal. It's largely technical, but my own role at the writing center is also viewed as a technical resource. And I feel resentful because I feel that my labor is cheapened when I'm essentially asked to do the leftover tasks that the professor cannot manage to do during their own lectures.

At the end of the summer, I applied for an adjunct gig in the English department. I was not offered the position, though I do find myself wondering if the person who had been hired had sent some of their students to the writing center. I found this glorified tutoring job because it was advertised as a graduate assistantship with a tuition waiver in addition to a monthly stipend.

I was hired, but the funding had been rescinded. I am paid by the hour, on limited hours because of ongoing budgetary cuts.

~

I'm never quite sure what Professors are worried about concerning these bots, but I avoid talking to them directly; instead, my mind turns to literature. In Nishanth Injam's story collection, *The Best Possible Experience*, technology is unexciting and largely exploitative. The issue of labor is always connected to technology. A character works as technical support for Bank of America in India. Another character is a coder. In a different story, a young man leaves India to study engineering in America because of the promise that AI is the future. That story was set in 2010.

Technology was just an uncomplicated detail in the stories. The author deliberately chose not to imagine what the technology could be or what their tech jobs entailed. It just was part of the world.

Outside of fiction, the same proclamation, that AI is the future, is stated each year, over and over again. When I interviewed Nishanth for my podcast, he said it so succinctly: "Technology is just a distraction, another form of capitalism."

Some of the overworked Professors have also turned to AI to help them with grading. But that grading shortcut has caused these students to depend on me. The same students return whenever another paper is due. I don't ask about their grades, but they voluntarily share positive news on an assignment we have worked through together. A student, in an offhand

way, commented that she cared about my opinion on her thesis statement. I'm not their professor, I always caution them, and my feedback can only help so much.

My schedule at the writing center has been booked for the last two months. Many students send emails, wondering if they could be on my waitlist. The writing center is an additional resource, not a class with a waitlist. I do not have a waitlist. I offer them options, that they could set up an appointment with one of my peers or that I will keep an eye on any cancellations and openings.

The supervisor of the writing center reminds us to write out every individual report after each appointment. These reports are used to log the center's traffic, as material evidence that the writing center is important enough to stay open. Metrics are used to entertain the possibility of its utility, not that students actually use it. The logic does not make sense.

Universities will defund whatever they want despite empirical data. Objectivity is only real when declared by those in power.

~

It is pitch black when I finally lock the door a few minutes after 7 pm. Across the street from my office is the newly built dorm and student union. The school is proud of their new additions. Very few of the students who make appointments at the writing center live in the gleaming dorm. Many are commuter students.

There is also news of Northeastern University purchasing land nearby to open a campus that specializes in machine learning and AI. Their blueprint promises a luxurious, boutique campus space, unlike where I work.

We know how the story will continue. Universities will compete with each other and will defund flailing resources and programs which have no place in an administrator's vision of the future. Someone at Northeastern will create an AI writing tutor, where there are no waitlists, no concerns of budget cuts. Most importantly, this tutor will not be so emotionally troubled by the university's chaos.

Yet somehow the role of The Professor will be maintained. It's a role that has seen its own dignity and security stripped away, but there are many who enjoy playing the role. The university needs this Professor.

BOOK REVIEW

The Everyday Untamed by Skye Bailey

Book Title: Tiger (Karavan Stories Workshop & Anthology project)

Authors: Kerry Hammerton, Karen Martin, Gail Gilbride, Desiree-Anne Martin, Michelle A. Meyer, Alexandra Wood, Anna Hug, Caitlin Spring, Lucienne Argent, Anita Shapiro, ChatGPT and Warren Jeremy Rourke. Intro by Karina M. Szczurek.

Published: Karavan Press, Cape Town

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Key words: Anthology, South African, Strong Women, Family Dynamics, Exotic Animals, AI

A result of the inaugural Karavan Stories Workshop and Anthology Project, *Tiger*, a ferocious short story anthology, has emerged from the undergrowth. The title of the anthology, which served as the theme from which the authors developed their stories (some more literally than others), was inspired by the case in which a tigress escaped from a private farm in Gauteng, South Africa in early 2023 and remained at large for a number of days until she was cornered and euthanized. Featuring works from eleven South African authors, and ChatGPT, the stories in *Tiger* explore grief, the unknown and untamed, dysfunctional families and complex characters with often animalistic language that shines a light on the wild side of everyday life - and the reverse.

This book review of the stories in *Tiger* seeks to objectively recount the stand-out features of the anthology, as well as its strengths and weaknesses. It begins by chronicling the themes which formed the backbone of the anthology, such as complex portrayals of women and often mothers specifically. Then, it speaks on the animalistic nature of the language and the portrayal of humanity used in the anthology, and spotlights two stories in particular which used this in

especially creative ways. Next, it explores the weak points and noteworthy stories within the anthology, all of which provide ample food for thought for the reader. Then, the penultimate paragraph outlines how even at their weakest, the human-written stories in *Tiger* still remain far ahead of its ChatGPT offerings, the exact failings of which are laid out in said paragraph. The final paragraph summarises the findings.

A theme which manifested consistently throughout the anthology was that of strong willed, complex female characters - a fitting development in light of the tigress who inspired the collection. In particular, the diverse, complicated relations between mothers and daughters was central in several stories, from Kerry Hammerton's slow-developing mother-daughter mystery in 'Tiger Girl'; to Karen Martin's abusive mother in the short and elusive 'The Whale'; Desiree-Anne Martin's vibrant and heartbreaking child narrator and absent mother in 'Colouring Inside the Lines' and Caitlin Spring's devastating portrayal of grief through the eyes of a daughter in 'Walk Away'. Women in these stories were imperfect, yet wild and strong as they dealt with the trappings of everyday life.

The theme of strong complex women featured in a variety of other ways. For instance, Gail Gilbride's 'Tigress' and Alexandra Wood's 'When Tigers Smoked' portrayed mothers of sons as overbearing and fierce in their (over)protectiveness - sometimes with disastrous results. Meanwhile, the women of Anna Hug's 'Caged', Lucinne Argent's 'See if it Settles' and Anita Shapiro's 'Maxine and Minette', dealt with feelings of captivity, animosity and regret on their paths, and remained within their gilded cages, forged new paths, or a combination of the two in at times shocking yet relatable developments. Finally, Warren Jeremy Rourke's sci-fi story 'Ere, in the Unhomely', which closes the anthology, featured a lioness in a vivid example of the number of uniquely South African interpretations of the theme within the anthology.

Perhaps one of the most stand-out facets of the anthology was the use of animalistic language. Characters resisted urges to "scratch someone's eyes out" (Gilbride 22-23), felt their senses sharpen "like a wild animal" (Meyer 48) and "whimper[ed] like a wounded mutt" (Wood 58). In other stories, children were described as cubs and cars purred and pounced as they stalked their way through locations across Cape Town, the Karoo and South Korea. Some stories took it further, like Hammerton's 'Tiger Girl' and Rourke's 'Ere, in the Unhomely', which open and close the anthology respectively, wherein the line between animals and humans blurred entirely. In the first story, a tiger shares its animalistic urges with a human, while in the last, animals

smiled and swaggered like their human counterparts. In these ways, the animalistic of the everyday and the everyday in the animalistic formed the link which runs throughout the stories of *Tiger*.

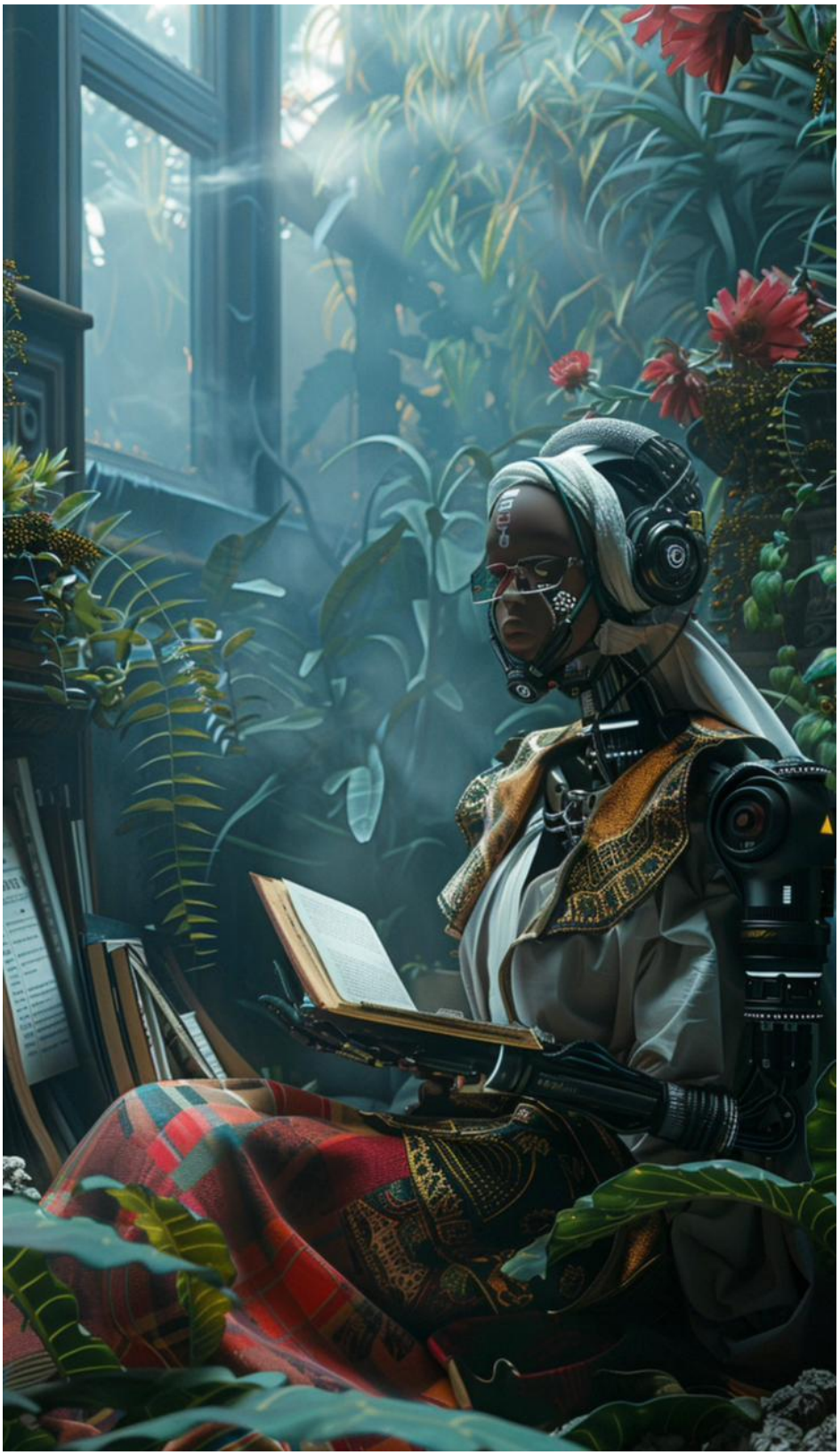
However, limitations which come with the length of short stories formed the root of the few disadvantages of the anthology. An example of this can be seen in Hammerton's 'Tiger Girl', an otherwise well paced and narrated story, which resolves its plot within a few lines in a way that feels mildly rushed. Others, like Martin's 'Whale', Shapiro's 'Maxine and Minette' and Rourke's 'Ere, in the Unhomely', all with intensely creative concepts, struggled to disseminate their information within the constraints of the short story format, leaving readers with more questions than answers. Despite these flaws however, the stories remained memorable for their creativity and intensity.

Within the anthology, there were also a few stories which especially stood out. One such was Hug's 'Caged', in which a young bride-to-be's feelings of imprisonment took the form of a tiger. The story culminates in a shocking scene, which includes the gorgeous imagery of the creature soaring over the narrator, its "snowy underbelly" passing with a rush of air (Hug 85). Another was Wood's 'When Tigers Smoked', set in South Korea and following an over-involved mother who makes use of an amulet bearing the image of a tiger to regain control over her son. The story combines traditional magic alongside a modern dysfunctional family in an interesting juxtaposition. Finally, Spring's 'Walk Away' offered a departure from others in the anthology. The story, which covers a mother and daughter dealing with their patriarch's final days, provided a heartrendingly realistic portrayal of the unavoidable dealings of death. Though featuring no notable animals or figurative animalistic language, the situation of the characters operating on their base animalistic instincts during the difficult time fit perfectly within the anthology's truly diverse offerings.

The short stories which felt the most out of place, despite heavily featuring tigers, were those included in ChatGPT's 'Whispers of the Untamed'. Alongside the often gritty, imperfect, intensely human stories on offer from the real authors, the three stories produced by the AI chatbot felt sorely lacking. Though punctuated with vibrant descriptive language, clear morals, picture-perfect pacing and - in very literal interpretations of the theme - featuring actual tigers as characters, the ChatGPT stories lacked much (or any) of the heart present in the others. Instead, there was a hollowness and lack of relatability that underlined each AI story, making

them feel like watered-down myths intended for children. In contrast, the final story of the anthology, Rourke's 'Ere, in the Unhomely', which comes directly after ChatGP's chapter and which, ironically and perhaps rightfully, features AI as the villain in a future war, felt wholly different despite its flaws - unmistakably human.

To conclude, *Tiger* stands as a strong anthology; human in its wildness and wild in its humanity, it provides an intimate look at the many kinds of families, relationships and people in South Africa and abroad, now and in the future. This comes in the form of a wide offering of different portrayals of women, presented with wildly creative language. Meanwhile, the juxtaposition between the human and AI stories bolster the important role of the human artist, showcasing first hand the impossibility of AI taking over humanity just yet. The case of the tigress being brought into human civilization which inspired the anthology is thus given new life in a diverse representation of the wild, the unknown and the untamed in our everyday lives.



By Charne Williams **(charnewilliams01@gmail.com)**

RESEARCH ARTICLES

Artificial Intelligence (AI) and Jean-Paul Sartre's Existentialism: The Link

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Abstract

The supremacy of man in the idea of existentialism positions him as the core component of nature. As the being that proposed the idea of Artificial Intelligence (AI), man is at the center of everything. The ideology of Existentialism, which champions the liberty of man to actualize his own ideas and create his essence in the world, does not believe in God. One aspect of this essence is the manifestation of AI, a creation that has made man more resourceful in his society. This paper delves into the significance of man's creation of AI and its profound link with the philosophy of Existentialism. Drawing from a broader philosophical context, this study explores the influence of Jean-Paul Sartre's existentialist works on Artificial Intelligence (AI) and how the latter has reflected on the nature of man. In conclusion, this paper will elaborate more on the significance of Artificial Intelligence (AI) in the nature of man, emphasizing man's role in its creation.

Keywords: Artificial Intelligence (AI), Existentialism, Man, Jean-Paul Sartre, Freedom

Introduction

Jean-Paul Sartre's Philosophy of Existentialism

In the 20th century, many philosophers reacted to the world's situation by creating their own understanding of existence. These philosophers include Søren Kierkegaard, Karl Jaspers, Albert Camus, Simeon de Beauvoir, Gabriel Marcel, Martin Heidegger and so on. However, in terms of the presentation of existentialist ideas, the concept created by Jean-Paul Sartre was unique because he experienced the issues at that time and had direct contact with its impacts. His experiences led him to extend the idea of existentialism. Such is recognized in the fact that during World War II, Sartre spent his time in the French army and also, he was captured as a prisoner of war in Germany. The ugly experiences led him to formulate his philosophy of Existentialism with its significant elements. His Existentialist Manifesto book titled *Being and Nothingness*, was written while he was still inside the prison. His ideas of Existentialism emerged from the book; these ideas include Freedom, Responsibility, Bad faith, Authenticity, Engagement and Anguish. According to Sartre, Existentialism's ideas were very important to adopt in the existence of man. This is because if individuals realized their absolute control of their being by themselves, bad experiences of war could have been avoided.

These ideas of Jean-Paul Sartre on Existentialism were employed in different literary works such *as Nausea, The Devil and the Good Lord, No Exist, The Flies, Dirty Hands, The Wall,* etc. According to Sartre, existence precedes essence, which implies that humans are born without a purpose, but their purpose is achieved by themselves through their authentic actions. The philosophical background of Existentialism establishes the theoretical backup of this work.

The Concept of Artificial Intelligence (AI)

The origin of the concept of AI can be traced back to 1956, during an academic conference, when John McCarthy first coined the term "artificial intelligence" (McGuire, 2006). After the conference ended, other scientists followed suit with the innovative concept of artificial intelligence.

Artificial Intelligence (AI), also referred to as Machine intelligence, is a technological advancement that requires the assistance of man for its operations. According to Ziyad Saleh in his publication, *Artificial Intelligence Definitions, Ethics and Standards,* he stipulated that AI can tackle learning, perception, problem-solving, language-understanding and logical

reasoning (3). He further explained the traits of AI, such as the capability of predicting and adapting, the ability to make decisions on its own, and continuous learning.

However, AI is forward-looking, thereby allowing people to analyze dates and integrate information. Saleh also added that AI is capable of being perceptive. This drives home the concept of AI as a digital computer that performs different tasks that are associated with human beings. AI represents machines that have implemented intelligence from humans. One example of such AI machines includes large–language models (LLMS) such as ChatGPT, which is widely used by students and teachers and has an appropriate response to a user query (Hans Pedersen, 39). AI (Artificial Intelligence) has spread worldwide and is explored in every sector.

Existentialist movements, as presented by Baert (2015) in his publication titled *The Existentialist Moments: The Rise of Sartre as a Public Intellectual*, stipulated the socio-economic and political implications that emerged in the 20th-century aftermath of the 1st and the 2nd World Wars, the Nazi death camps, and the Hiroshima's bombing. These events prompted the emergence of the idea of Existentialism. Man decided to question his existence and find out the means to justify his existence without the mercy of his creator.

This evolved beyond measure as many critical minds sought and obtained the forum to extend thoughts using the philosophy of existentialism. Of course, existentialism became canonized. These ideas, as well, became captured in the literary world and in other aspects of life. The significant aspect of Existentialism is that it provides for the exercise of one's own choice, freedom to exercise one's rights and privileges, and freedom to utilize one's own ideas without the interception of or resort to a greater being.

This is based on its concept, which stipulates that existence precedes essence, which implies that essence is not given in advance. Rather, man is first thrown into his existence, and he is tasked with creating his own essence or personality through his authentic acts and choices in life. Jonathan Webber (2009) initiated a new interpretation of Sartrean existentialism by not only focusing on human existence; rather, he relates his idea of existentialism to its importance in the psychology of agency, ethics, character, and selfhood. This, thus, positions Existentialism to blend the thoughts of human existence and scientific innovations.

Sartre's book, *Existentialism is Humanism*, stipulates the meaning of humanism whereby humans act in pursuit of goals and values outside themselves in order to make their existence meaningful (J. Rohan,22). This, by implication, reveals the objective of creating AI by man in order to bring essence to his existence as a human being. However, to justify the connection of

AI (Artificial Intelligence) with the ideas in Existentialism will be mainly achieved based on the Existentialist ideas of Freedom, responsibility and bad faith because Freedom in the philosophy of Existentialism gave man the opportunity to create Intelligence that is artificially generated in order to achieve his essence in life. Bad faith assures man of his denial of his freedom, thereby shaping his own identity through technological means, while Responsibility makes him responsible for his actions in creating a machine to sustain him.

In another justification, AI represents the centre of technological advancement that contradicts the traditional method of doing things. However, amidst its scientific nature of being man-made, there exists a significant connection with the ideas of Existentialism, which is, man making his own life. In a concrete term, both concepts do not recognize the existence of a supreme being rather, they dwell sorely on human-oriented capacity. Thus, this study examines significant relationships and interceptions of Jean-Paul Sartre's existentialist ideas and AI. By examining AI's relationship with human Freedom, Responsibility, and Bad faith, the elucidation of AI's nature is interrogated, and deeper reflections on human existence is posited.

The Essenceful Intersection of Existentialism and AI

This section interprets the conceptual differences and similarities between the two notions of AI (Artificial Intelligence) and Existentialism. It explores the parallels between AI and Existentialism based on their backgrounds, natures, contents, and elements. This subject elucidates the significant affinity between Human existence and Machine Intelligence.

Based on the fact that the central idea of Existentialism is based on the view that man has the freedom to create his own destiny by his own choice (Sartre, 292); by implication, man defines his own standard of living by his own choices. Similarly, this is also attributed to the formation of machines by man in order to achieve a better standard of living. The machine is recognized to play the role of sustaining man for him to be purposeful on earth. This is recognized as a positive impact of Artificial Intelligence, which remains relevant in human existence. However, the central problem usually encountered by human beings is using Artificial Intelligence as a platform to create an existentialist threat to humanity, which could only be resolved by using existentialist elements such as Freedom, Responsibility and Bad faith. This central problem happens because Artificial Intelligence has become too powerful and too intelligent for humans to easily control (Hans Pedersen, 39). This central problem can be seen as a negative impact of Artificial Intelligence on humanity.

In another dimension, the concept of Artificial Intelligence contradicts the conceptual meaning of human existence by introducing non-human entities or machines with intelligent abilities. This contradiction limits the influence of man as the centre of all, as portrayed by Existentialist thought. The interception of Artificial Intelligence in Sartre's idea of Freedom and Responsibility is stipulated in this form; man is free to make his own choices and takes responsibility for his choices, so also, in connection with AI, this Freedom is constrained by technological determinism, thereby focusing on technological advancement rather than human development. This results in man not having full responsibility for his own destiny because machines seem to have replaced it. Also, talking about Existentialist Responsibility in terms of Artificial Intelligence, Mark Coeckelbergh Nick named it a narrative responsibility (2437) because of its connection to AI knowledge and because the innovation of Artificial Intelligence challenges human responsibility.

The Significant Connection Between AI and Bad Faith

In exploring the Existentialist ideas of Jean-Paul Sartre, we would definitely encounter the concept of Bad faith, which is recognized when a man is thrown into existence without any fixed objectives, and man experiences Bad faith in his attempt to get rid of himself from discomfort (Hans Pedersen, 43). This action of denial makes a man act as being-in-itself (43). However, from the angle of another philosopher, Simeon de Beauvoir, argues that such denial of our existence is based on bad faith, which makes man a serious man (*l'homme serieux*) because as the human being is thrown into existence without any objective, the human being must pursue his objective seriously. From the explanation of Bad faith according to Sartre and Beauvoir, we could denote the connection between Artificial Intelligence and Existentialism. This is justifiable in the sense that the model of AI (Artificial Intelligence) is produced to be a serious and objective machine, and it takes its tasks seriously and brings out the optimum results needed.

Conclusion

The emergence of Existentialism and that of the concept of Artificial Intelligence is seen as a problem solver in a critical time. The introduction of Existentialist thought helped man to realize the significance of human existence while Artificial Intelligence helps man to solve his

everyday problems. Artificial Intelligence is a machine created by man, and this still showcases the evidence of Existentialism in man whereby man is in charge of all, and he is in the centre of all, even the machine-oriented sphere. The interrogation of how Artificial intelligence connects with Existentialist themes of Freedom, Responsibility, Bad faith, and the nature of human existence has widened the horizon of understanding the different ideas that govern the understanding of human existence.

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Harnessing Sustainable Healthcare through the Synergy of Artificial Intelligence (AI) and Blockchain Technologies in Kenya

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Abstract

Embarking on the frontier of healthcare transformation, the fusion of Artificial Intelligence (AI) and blockchain technologies in Kenya promises to redefine medical landscapes and serves as a beacon for sustainable development in a rapidly evolving digital era. The study employs a comprehensive approach, evaluating economic, social, and environmental dimensions to assess the impact of these technologies. Through a mixed-methods research strategy focusing on key healthcare projects, including *AfyaRekod, Tambua Health, Ilara Health, PanaBIOS,* and *Sophie Bot*, the research navigates challenges and highlights opportunities for transformative change. Key themes include; economic sustainability, emphasizing cost-effectiveness, resource optimization, and equitable growth. The study addresses social impact, focusing on healthcare access, patient experiences, and ethical considerations, and evaluates the environmental footprint, promoting strategies for minimizing energy use and adopting eco-friendly practices. Despite challenges in technology infrastructure and regulatory frameworks, the study underscores the transformative potential of AI and blockchain technologies. The findings provide crucial insights for informed decision-making, policy formulation, and the harmonious integration of technology with regulatory frameworks, ultimately contributing to a sustainable and balanced healthcare ecosystem.

Keywords

Artificial Intelligence, *Blockchain Technology, Economic Sustainability, Environmental Sustainability, Kenya, Social Sustainability*

Introduction

Integrating Artificial Intelligence (AI) and blockchain technologies in healthcare has gained increasing significance, driven by a growing awareness of sustainability and the imperative to preserve resources for future generations. Sustainability, as defined by the United Nations Brundtland Commission (1987: 16-27), involves the responsible use of natural resources to meet present needs without compromising the ability of future generations to meet their own. This comprehensive evaluation explores economic, social, and environmental dimensions to assess the effective integration of these technologies into healthcare systems, aiming to ensure integration without depleting resources, causing harm to the environment, and concurrently promoting economic growth and social well-being (United Nations Brundtland Commission, 1987: 78, 141-167).

Aligned with the goal of sustainable development, as articulated by Moore (2015), which seeks to enhance the socio-economic well-being of humanity, this assessment adopts a multifaceted and all-encompassing approach. Social impact encompasses healthcare access, patient experiences, equity, and ethical considerations, assessing how these technologies can improve access for underserved populations and address disparities among different social groups (Bompelli *et al*., 2021; McFarlane et al., 2020: 1-8). Economic impact pertains to cost-effectiveness, financial benefits, and efficiency in resource allocation, aiding policymakers and healthcare professionals in decision-making (Cheikosman and Mulligan, 2023: 19-23; Garikapati *et al*., 2022: 4, 7). Environmental impact focuses on ecological footprint and sustainability, emphasising strategies to minimise energy use and adopt environmentally friendly practices (Munir *et al*., 2022: 1-19). This multidimensional approach provides a holistic understanding of the potential benefits and challenges of AI and blockchain in healthcare. The knowledge derived from this evaluation is crucial for informed decision-making, policy formulation, and sustainable practices that maximise positive impacts while minimising potential risks and drawbacks.

AI and blockchain technologies align with the broader goals and strategies of Kenya's healthcare system, offering improved service efficiency, reduced costs, and democratised healthcare (Tagde *et al*., 2021: 52810). Addressing the crucial need for AI applications, blockchain technology provides a secure and immutable platform for data storage and sharing, enhancing the reliability and trustworthiness of AI-based healthcare (Tagde *et al*., 2021: 52827). A conceptual framework by Shinde et al. (2022) integrates AI and blockchain

technologies effectively, aligning capabilities with the specific requirements of different AI domains. Through this integration, healthcare systems can support their broader goals and strategies. AI in telehealth aligns with broader healthcare goals, positively impacting sustainability by reducing the carbon footprint, optimising resources, improving outcomes, and enhancing accessibility to quality care (Amjad, Kordel, and Fernandes, 2023). The combination of telehealth and AI addresses environmental sustainability by minimising patient travel-associated emissions, optimising resource allocation, and improving access to care, particularly in remote areas.

However, challenges such as technology infrastructure, expensive internet access, and inadequate regulatory frameworks pose significant hurdles (Baker, Breitsprecher, and Guthoff, 2022). Targeted support is essential to ensure the sustainable implementation of healthcare technologies. The adoption of blockchain technology introduces legal and regulatory challenges due to its decentralised nature, necessitating governance approaches for decentralised entities (Baker, Breitsprecher, and Guthoff, 2022: 47). Regulators in Kenya must understand, monitor, and influence this transformation, considering varying regulations related to AI usage across countries (Frąckiewicz, 2023). Legal, regulatory, and policy considerations are crucial for measuring sustainable healthcare products, processes, and organisations. Determining data for evaluating Environmental, Social, and Governance (ESG) criteria becomes a crucial question, with Baker, Breitsprecher, and Guthoff (2022: 46) emphasising the preference for primary data continuously measuring factors such as CO2 emissions or electricity consumption. Comprehensive legislation, such as the European Union's General Data Protection Regulation (GDPR), safeguards individual privacy and provides guidelines for data collection and processing (Amjad, Kordel, and Fernandes, 2023: 17). Tailored solutions, including voluntary privacy regulations for mobile health apps, are necessary to address specific challenges (Amjad, Kordel, and Fernandes, 2023: 17). Legal and regulatory support is crucial for the development trajectory of blockchain technology, addressing issues such as privacy, money transmission, anti-money laundering, and information reporting (Yeoh, 2017, in Kawabata and Acharya, 2019: 6).

In essence, the integration of AI and blockchain technologies within Kenya's healthcare sector signifies a significant stride towards fostering sustainable development, aligning with the objectives of Sustainable Development Goal 3 (SDG 3). Despite challenges, the potential impact of these technologies on reshaping healthcare delivery, ameliorating healthcare outcomes, and advancing sustainable agendas is profound. Projects like PanaBIOS, Ilara

Health, Sophie Bot, Tambua Health, and AfyaRekod exemplify the transformative potential of AI and blockchain technologies in the healthcare landscape, enhancing accessibility, and patient experiences, contributing to a more balanced and sustainable healthcare ecosystem. The intricate interplay of technological infrastructure, regulatory frameworks, and institutional capabilities necessitates a holistic approach to ensure sustainable implementation, emphasising the importance of harmonising technological advancements with regulatory frameworks for responsible and ethical implementation. The integration of AI and blockchain technologies in Kenya's healthcare landscape holds substantial promise for achieving sustainable development objectives, contributing to a healthier, more equitable, and enduring future.

Materials and Methods

This research employs a mixed-methods approach to investigate the impact of AI and blockchain technologies on healthcare in Kenya. Qualitative analysis, guided by Graf, Tuly, and May (2021), delves into literature, policies, and organisational statements. The study utilises a case study method, focusing on five key healthcare projects, including AfyaRekod's EHR management, Tambua Health's AI-driven lung-sound analysis, Ilara Health's AI diagnostics, PanaBIOS' disease surveillance with AI and blockchain, and Sophie Bot's AI chatbot for sexual health. Quantitative analysis assesses numerical data, tracking changes in health outcomes post-technology implementation (Nowell *et al*., 2017; Kiernan, 2014). Thematic and descriptive analysis handle qualitative and quantitative data, respectively (Nowell et al., 2017; Kiernan, 2014). Data collection focuses on the period after 2015, aligning with the introduction of the United Nations SDGs.

The integration of qualitative and quantitative methods aims for a comprehensive understanding of technology implications. Triangulation enhances data reliability, aligning with mixed methods' efficacy in health sciences (Guetterman, Fetters, Creswell, 2015). Stakeholder engagement, even in desktop research, ensures contextual relevance, credibility, and ethical conduct. Qualitative analysis examines literature, policies, and vision statements, offering rich insights (Dalglish, Khalid, McMahon, 2020; Martínez-García et al., 2019; Bowen, 2009). Acknowledging potential biases, the researcher commits to objectivity and a balanced perspective. Quantitative analysis, crucial for assessing technology impacts, relies on statistical methods and addresses efficiency, risks, costs, and benefits. It aids in understanding trends and providing structured insights (Gupta et al., 2023; Chan, 2023; Li et al., 2023; Erol et al., 2020;

Parker and Bach, 2020). Quantitative research involves systematic collection and analysis of numerical data, ensuring generalisability through probability sampling (Sheard, 2018; Williamson et al., 2018). The case study approach explores specific healthcare projects, offering a deep, multi-faceted understanding (Bowen, 2009). Its historical significance and evolution highlight its effectiveness in testing theories and presenting solutions (Rivero, 2022; Freemantle, 2016). Case studies facilitate intensive analysis of unique phenomena, promoting a holistic understanding and uncovering nuanced details (Drew, 2023; Gaille, 2018). The study's case selection includes diverse projects, ensuring a comprehensive exploration of healthcare innovation in Kenya.

Case studies are instrumental when researchers lack control over variables, enabling immersion in real-life settings for natural observation (Tetnowski, 2015, in Drew, 2023). They aid in developing new theories and hypotheses, exemplified by the Eisenhardt Method (Rivero, 2022), which transforms detailed case studies into concrete organisational theories (Rivero, 2022). However, case studies have limitations, such as limited generalisability and potential bias in qualitative data analysis (Drew, 2023; Williamson et al., 2018: 537-564). Replicating results can be challenging, underscoring the need for careful consideration when employing case studies (Drew, 2023; Morse, 2021, in Sheard, 2018: 2). To address these limitations, combining case studies with quantitative analysis becomes essential for a comprehensive exploration of healthcare innovation in Kenya, particularly the impact of AI and blockchain technology. Criteria for selecting case studies in this research include the projects based on AI and blockchain, operating in Kenya, founded by Kenyan individuals after 2015, and addressing healthcare challenges. The five selected projects – AfyaRekod, Tambua Health, Ilara Health, PanaBIOS, and Sophie Bot – contribute significantly to improving healthcare outcomes in Kenya through technology integration and partnerships, contradicting dependency theory.

Thematic analysis is employed for document analysis around case studies, utilising the Large Language Model (LLM) ChatGPT. Thematic analysis, introduced by Braun and Clarke in 2006, identifies patterns or themes in qualitative data, offering flexibility but lacking a specific structure (Braun and Clarke, 2006). ChatGPT is used effectively when guided by well-designed prompts, addressing human analysts' concerns (Zhang et al., 2023: 22). The study employs descriptive analysis to evaluate health indicators before and during the implementation of AI and blockchain projects, measuring changes in behaviour resulting from these interventions. Rigorous evaluation methods and advanced statistical analyses are considered to determine the projects' impact on health outcomes. Descriptive statistics are used to summarise and interpret

research data efficiently, providing numerical or graphical representations of data. Google Sheets is employed for organising and analysing numerical changes in health indicators over time, extracting trends to assess improvements since the introduction of eHealth projects.

Discussion

In Kenya's healthcare sector, the integration of AI and blockchain technologies by AfyaRekod, Tambua Health, Ilara Health, PanaBIOS, and Sophie Bot is reshaping the approach to sustainable healthcare. These platforms use blockchain for transparent and ethical supply chains, emphasising social sustainability. The combination of electronic health records (EHRs) and AI addresses Social Determinants of Health (SDoH), impacting health outcomes. Barriers to blockchain adoption include social factors and developmental challenges, highlighting the delicate balance needed between innovation and societal acceptance. Economic sustainability is explored, focusing on ethical technology use, resource optimisation, and equitable growth for healthcare goals. Alignment with the United Nations' Sustainable Development Goals is evaluated, addressing potential risks of economic instability and environmental degradation. Moving to environmental sustainability, the discussion examines the environmental impact of AI and blockchain, emphasising the need to balance technological progress with ecological preservation. Economic sustainability is then dissected, unravelling factors influencing healthcare outcomes within economic constraints.

Challenges in healthcare infrastructure underscore the need to increase GDP allocation to the sector. In AI integration, the often-underestimated long-term costs and potential economic opportunities at the local level are explored. The role of blockchain and AI-driven technologies in streamlining financial processes, reducing costs, and improving service efficiency contributes to overall sustainability objectives. Challenges related to poverty reduction, digital literacy, and literacy levels highlight the necessity for a comprehensive approach. This discussion concludes by emphasising the pivotal roles of perceived financial costs, innovativeness, governmental pressure, incentives, and regulatory support in shaping AI implementation in healthcare, providing a nuanced understanding of the transformative potential and challenges in Kenya's healthcare ecosystem.

Social and Political Sustainability

The multifaceted applications of AI and blockchain technologies in Kenya's healthcare system align with the principles of social sustainability, as highlighted by Kumar and Dagar (2021: 1138-1141). They emphasise the potential of blockchain, as a disruptive technology, to enhance the social sustainability of supply chains. Blockchain's unchangeable data and consensus-based decision-making mitigate unethical practices in supply chain management. Research indicates that social and behavioural determinants of health (SBDH) or SDoH significantly impact health outcomes. Bompelli et al. (2021: 1-7) emphasise the use of electronic health records in observational studies during the AI era. However, effectively leveraging SBDH information from EHRs through AI approaches remains an underexplored area. Social determinants contributing up to 40% to health outcomes (Dankwa-Mullan et al., 2021: 308) necessitate an in-depth analysis of blockchain technology, and the current state of SDoH to accelerate its adoption for improved health outcomes (McFarlane et al., 2020: 2-6).

Despite the potential benefits, barriers to the adoption of blockchain technology in healthcare exist. Social factors, including concerns about trust, workplace dynamics, and vulnerability of lower-level workers, present challenges (Kumar and Dagar, 2021: 1138-1141). In addition, developmental immaturity poses technical challenges, requiring specialised attention for effective integration (Kumar and Dagar, 2021: 1138-1141). Akinradewo *et al*. (2022: 925-926) identify societal challenges, including social acceptance, high energy consumption, legal uncertainties, system complexity and cost, transactional-level uncertainties, vague supportive data regulation, and poor economic behaviour, which impede blockchain adoption. Companies like AfyaRekod, Tambua Health, Ilara Health, PanaBIOS, and Sophie Bot illustrate how technology can address social challenges. They prioritise accessibility, inclusivity, and ethical considerations, ensuring the privacy and security of patient data, delivering accurate medical insights to underserved areas, and addressing information gaps on reproductive health. These efforts contribute to social sustainability by promoting equitable healthcare delivery.

The sustainability of AI and blockchain technology in Africa faces challenges related to legal, regulatory, and policy considerations. While blockchain has transformative potential in healthcare, integrating it requires alignment with existing regulatory frameworks (Amenta, Sanseverino, and Stagnaro, 2021). Internationally, the lack of consensus on governance mechanisms for AI technologies in healthcare poses technical and social barriers (Morley *et al*., 2022). Efforts by the Kenyan government to regulate AI and blockchain technologies

through the Data Protection Act and other acts impact the operations of platforms operating at the intersection of technology and healthcare. At the regional level, the African Union's initiatives—such as the Malabo Convention and the AI Continental Strategy—aim to regulate AI and blockchain technology, promoting ethical use and data privacy. Internationally, the European Union's AI Act provides a regulatory framework for AI systems, emphasising risk categorisation and stringent requirements for high-risk applications. Platforms like these case studies are directly affected by evolving regulatory frameworks, influencing their operations and social sustainability. Adhering to these regulations is crucial for ethical technology usage, building user trust, and ensuring social sustainability in the healthcare sector. The ability of these platforms to navigate and comply with national, regional, and international regulations profoundly influences their ethical innovation and contributes to achieving SDG 3. Successfully adhering to regulations promotes accessible, ethical, and effective healthcare solutions, benefiting individuals and societies at large.

Environmental Sustainability

Enhancing healthcare access, optimising data management, improving diagnostics, and facilitating digital information dissemination all have the potential to minimise resource wastage and enhance the efficiency of healthcare delivery, aligning with broader sustainable development objectives. However, the deployment of Tambua Health, AfyaRekod, Ilara Health, PanaBIOS, and Sophie Bot in various ways could either positively or negatively impact the environment. While these AI- and blockchain-backed projects hold the potential to significantly advance healthcare in Kenya, they must also prioritise environmental responsibility. This section aims to explore these implications.

The concept of sustainable AI has gained critical attention, emphasising the need to ensure that advancements in AI technology prioritise energy efficiency (Zia, 2023). Despite the positive impacts of AI developments, they contribute to environmental concerns, particularly the escalation of carbon footprint (Marr, 2023; Zia, 2023; Bhat, 2022). The research community is actively exploring secure, privacy-preserving, and sustainable healthcare systems by leveraging emerging technologies like blockchain. As climate engagement becomes a focal point for regulators, investors, and the public, there is a growing need for impactful green investments (Cheikosman and Mulligan, 2023; Amenta, Sanseverino, and Stagnaro, 2021). Alzubi et al. (2021: 1-14) emphasise the essential roles that the Internet of Things (IoT) and AI

play as fundamental pillars in creating innovative, sustainable computing solutions for e-healthcare applications. In a sustainable healthcare system enabled by IoT, patient data collected by IoT devices is transmitted to the cloud for processing. Similarly, blockchain technology enables organisations to contribute to a low-carbon future by leveraging environmentally friendly solutions supported by transparent data (Amenta, Sanseverino, and Stagnaro, 2021). This combination empowers the establishment of sustainable practices and facilitates the transition towards a greener economy. Richie (2022: 1-2) emphasises that the primary consideration in AI use in healthcare should be the environmental impact, rather than solely focusing on software vulnerabilities like data manipulation and privacy breaches. Waiting for empirical data on carbon emissions before implementing changes in consumption habits is not prudent; addressing climate change requires immediate action to reduce carbon emissions (Richie, 2022: 3). These perspectives underscore the need for prioritising sustainability and considering environmental impacts in the development and implementation of AI and related technologies within the healthcare sector.

Bhat (2022) highlights that AI model training demands significant energy, prompting consideration of benefits versus environmental costs. While AI offers eco-benefits, it also requires a careful energy balance. AI workflows use much energy yearly, requiring efficiency enhancement. Tambua Health can enhance its commitment to sustainable AI by optimising its AI model training techniques and minimising energy consumption during diagnostic procedures. Ilara Health, through its innovative medical diagnostics platform, can adopt energy-efficient AI model training strategies to ensure technological progress aligns seamlessly with sustainable AI principles. Ironically, AI itself can play a role in addressing its own environmental impact by optimising processes and making decisions that reduce energy consumption (Bhat, 2022). The exponential growth of data and its subsequent rise in energy consumption may have an adverse effect on global efforts to combat climate change (Podder, 2021 in Marr, 2023). Incorporating energy consumption measurements alongside performance and accuracy metrics in AI research publications can raise awareness of the environmental impact of AI technology and foster greater accountability.

Zia (2023) highlights the significant environmental impact of AI arising from its intensive computing power and energy demands. Training a single large-scale language model can emit a substantial amount of CO^2, stressing the need to balance AI progress with environmental responsibility. Similarly, the energy-intensive nature of blockchain network mining presents a significant consideration, emphasising the need to minimise the carbon footprint associated

with energy-intensive blockchain-based Electronic Health Record (EHR) systems. While blockchain technology holds the potential for positive contributions to healthcare, the substantial energy consumption associated with public blockchains raises significant concerns. Public blockchains used for cryptocurrencies, characterised by high operational costs and energy usage, could hinder progress towards achieving sustainable healthcare, especially in regions with limited energy resources. Despite concerns about blockchain's carbon footprint and costs, studies indicate that blockchain could yield a 20% reduction in carbon emissions when using energy from renewable sources (Coutinho *et al*., 2022: 12). When implementing such systems, addressing challenges becomes paramount. Unequal healthcare resource distribution, substantial carbon emissions, and possible distrust among health providers and patients towards blockchain technology need collective efforts from various communities. Trust in the security, privacy, and integrity of such systems is vital for their successful adoption and widespread use (Han, Zhang, and Vermund, 2022: 5). Blockchain technology has the potential to contribute to the circular economy, reducing transaction costs, enhancing supply chain performance, and lowering carbon footprint (Upadhyay *et al*., 2021: 6). Further, AfyaRekod's partnership with IndyGene US exemplifies this by building a blockchain-encrypted repository of indigenous African data, positively impacting the environment. By addressing energy consumption and environmental implications, these initiatives can ensure that their technological advancements align with Kenya's broader sustainable development goals, fostering a balance between technological progress and ecological preservation.

Economic Sustainability

The economic sustainability of AfyaRekod, Tambua Health, Ilara Health, PanaBIOS, and Sophie Bot, in achieving sustainable healthcare, hinges on their ability to enhance healthcare outcomes while operating within economic constraints. Adhering to ethical use of technology, resource optimisation, and equitable growth contributes to of sustainable healthcare goals. The impact on poverty reduction, healthcare quality, and alignment with Kenya's economic landscape determines the extent of their success. However, the development and deployment of artificial intelligence and blockchain technology in healthcare raise concerns about economic viability, compatibility with existing frameworks, and potential legal and ethical implications (Garikapati *et al*., 2022: 133-134). It is essential to evaluate whether these

advancements align with the United Nations' Sustainable Development Goals (SDGs) or could lead to economic instability and environmental degradation (Garikapati *et al*., 2022: 133-134).

Economic sustainability, defined as meeting present needs without compromising the ability of future generations to meet their own, is critical (Garikapati *et al*., 2022: 133-134; Moore, 2015). It encompasses aspects related to management, technology, and clinical practices within the healthcare system (Dicuonzo *et al*., 2021). The link between economic security and health outcomes is well-recognised, and with anticipated population growth and advancements in healthcare technology, innovative approaches are needed to deliver better healthcare and improve outcomes while optimising resource use (McFarlane *et al*., 2020: 4). Decentralisation is inherent in healthcare, but not a requirement for leveraging SDoH. Blockchain technology accommodates a decentralised organisational model without enforcing a decentralised system of care. Blockchain-based systems have the potential to reduce costs, eliminate intermediaries, and enhance interoperability in health information exchange, aligning with social sustainability (Deloitte, 2016: 11). However, challenges associated with inadequate healthcare infrastructure in Kenya, such as limited resources, unreliable electricity, and poor transportation systems, could hinder the economic sustainability of these platforms (DBSA, 2023; Phelan, Yates and Lillie, 2022: 501-503; Clausen, 2015). To effectively implement these technologies in healthcare, it is crucial to increase the percentage of GDP allocated to the healthcare sector. Investment in AI is crucial for sustainable development globally, serving as a key driver of productivity and economic growth (Damoah, Ayakwah and Tingbani, 2021: 1). The Kenyan government's current allocation to the healthcare sector is significantly lower than other developing countries, highlighting the need for increased investment (Garikapati *et al*., 2022: 134; Trading Economics, 2023).

Despite the initial enthusiasm surrounding AI integration, the economic sustainability of AI in healthcare is often underestimated. The long-term costs associated with data acquisition, system training, and continuous evolution can be significant. Establishing a specialised centre of excellence or hiring experienced personnel is advisable to manage these costs effectively (Krishna, 2023). The potential economic opportunities and sustainable development at the local level through AI adoption, as seen in medical drone activities involving local communities, demonstrate the social responsibility of organisations (Damoah, Ayakwah and Tingbani, 2021: 3). Blockchain and AI-driven technologies have the potential to streamline financial processes, reduce costs, and improve service efficiency. Ilara Health's strategic partnerships showcase how AI-driven technologies optimise resource allocation, generate cost savings, and improve

service efficiency (Frąckiewicz, 2023; Awosanya, 2019; Mwololo, 2018). These technologies contribute to healthcare access, diagnostics, and patient outcomes, aligning with overall sustainability objectives. Medical drones, for example, contribute to long-term corporate sustainability and socio-economic benefits. They save staff hours, create employment, reduce mortality rates, and improve socio-economic conditions (Damoah, Ayakwah and Tingbani, 2021). However, challenges related to reducing individuals below the poverty line, promoting digital literacy, and increasing overall literacy levels need to be addressed for widespread access to these technologies. The perceived financial costs, innovativeness, governmental pressure, incentives, and regulatory support play crucial roles in AI implementation in healthcare. Effective risk management and strategic implementation are essential for assessing and managing potential risks and uncertainties (Choi, 2022). Blockchain's potential to improve traceability, information sharing, transparency, and decentralisation in supply chains aligns with efforts to enhance efficiency and accountability (Munir *et al*., 2022: 1-18). However, concerns about the economic and social sustainability of blockchain are raised, emphasising the need for careful analysis and management of risks.

Conclusion

AI and blockchain technologies in Kenya's healthcare system represent a multifaceted approach to achieving social, economic, and environmental sustainability. These innovative technologies have the potential to revolutionise healthcare delivery, improve diagnostics, and streamline processes. However, several challenges and considerations must be addressed to ensure their sustainable and responsible implementation.

From a social sustainability perspective, the platforms under consideration demonstrate a commitment to equitable healthcare delivery, privacy, and security of patient data. By addressing social challenges, such as accessibility and inclusivity, these technologies contribute to building a healthcare system that serves a diverse population. Furthermore, the emphasis on ethical considerations, inclusivity, and user trust aligns with the principles of social sustainability, fostering a healthcare environment that benefits individuals and communities. The regulatory landscape poses challenges to the social sustainability of these platforms, requiring adherence to evolving national, regional, and international frameworks. Striking a balance between innovation and compliance is crucial for ethical technology usage and user trust, ultimately contributing to the achievement of Sustainable Development Goal 3.

Environmental sustainability considerations highlight the need for a careful balance between technological progress and ecological preservation. While AI and blockchain have the potential to enhance healthcare efficiency, their energy-intensive nature raises concerns about carbon emissions. The deployment of these technologies must prioritise energy efficiency, incorporating sustainable practices to minimise environmental impact. Initiatives like blockchain-encrypted repositories of indigenous African data showcase how technology can positively impact the environment. Economic sustainability, a critical aspect of the platforms' success, hinges on their ability to enhance healthcare outcomes within economic constraints. Managing costs associated with AI model training and blockchain deployment is crucial for long-term economic viability. The potential economic opportunities at the local level, such as medical drone activities involving local communities, exemplify the social responsibility of these organisations and contribute to sustainable development.

In sum, the successful integration of AI and blockchain technologies in Kenya's healthcare system requires a holistic approach that addresses social, environmental, and economic dimensions. By navigating regulatory challenges, optimising energy consumption, and ensuring ethical and inclusive practices, these platforms can contribute to a sustainable and resilient healthcare ecosystem in Kenya.

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About the cover

Our cover art was produced by Charne Williams (charnewilliams01@gmail.com). She used alora.ai to create her unique artworks capturing the Artificial Intelligence (AI) theme.

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Peter Oyewole Makinde is a researcher who is passionate about teaching and writing. He is a doctoral student in the Department of Linguistics at the University of the Western Cape. His thesis focuses on multisemiotic discourse analysis of the representation of medicines in Nigeria. His areas of specialization, among others, include General Linguistics, Social Semiotic Stylistic analysis, Discourse analysis, Social Semiotics, and Multimodality. He obtained his undergraduate and postgraduate degrees from Nnamdi Azikiwe University, Awka, with a specialization in English Language and Literature. Peter Makinde is also a Lecturer in the Department of Linguistics at Nnamdi Azikiwe University, Awka, and has served in various capacities as a member of many committees within and outside the University. He is also a Co-Founder of West Africa Systemic Functional Linguistics (WASFLIG) and a member of many professional associations. He has several publications in recognized international and local journals and has participated in over 20 conferences, webinars, and seminar series at local and international levels. He is currently the Editor-in-Chief of the *WritingThreeSixty* Journal.

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her Bachelor of Arts degree majoring in English and Linguistics. During her final year of her undergraduate studies, she completed a creative writing course and later went on to publish an original poem in *The Fishbone* Online Magazine. While she continues to pursue her passion for writing and develop her skills, she is currently writing a few novels and short stories. She enjoys reading poetry, novels, and short stories. She hopes to pursue a career in academia as a researcher. Laeeqah Ebrahim is currently an assistant to the creative content manager and the social media manager at the *WritingThreeSixty* postgraduate journal.

Quasiema Hendricks (Social Media Manager & Secretary)

Quasiema Hendricks is a passionate writer and researcher. She is currently a Master of Arts student in the Anthropology department at the University of the Western Cape and her thesis is concerned with the lived experience of ADHD adults. Her research investigates the tension between the way that ADHD adults experience their ADHD symptoms and the capitalist expectations toward productivity that assume a neurotypical subject within workplaces, educational settings, and social settings, in Cape Town, South Africa. Quasiema completed her Honours degree in Anthropology and was supervised by Prof Heike Becker. She completed her Bachelor of Arts degree with a triple major in Anthropology, Sociology, and Psychology at UWC. She is passionate about writing and research and wishes to pursue a career as a lecturer in Anthropology and conduct research about ADHD as she has a passion for academia and wishes to be actively engaged in research about the concerns of neurodiverse people. She is currently appointed as a writing coach at the UWC Writing Centre, and she is the Social Media Manager and Secretary of the *WritingThreeSixty* postgraduate journal.