



**Artificial Womb Technology in Africa: Evaluating the Ethico-Cultural Implications
from a Zulu Indigenous Perspective**

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DECLARATION

I, Samkelisiwe Mthwane, declare that:

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2. This thesis has not been submitted for any degree or examination at any other university.
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Samkelisiwe

Signature:

Date 27/11/2025.

Prof. Beatrice Okyere-Manu

Signature

Date: 27/11/2025

DEDICATION

To my mother, Nobuhle Mthwane, for whom I work so hard to make proud.

And

All my Siblings;

To believe in me, even when I did not believe in myself.

ACKNOWLEDGEMENTS

I am deeply grateful to those who supported me throughout this research journey. First and foremost, I extend my heartfelt thanks to God, whose unwavering guidance, strength, and wisdom sustained me through every challenge and milestone in this work.

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ABSTRACT

This study examines the ethical and cultural challenges posed by Artificial Womb Technology (AWT) through the lens of Zulu Indigenous thought, using the framework of *Isintuism*. The study outlines that AWT, by transferring gestation from the human body to an artificial environment, contributes to various challenges to core Zulu values. The technology disrupts the sacred role of the mother, interferes with ancestral rituals essential for establishing lineage and personhood, and commodifies the natural processes of life. The study concludes that the Artificial Womb Technology has potential biomedical advantages, however the technology poses challenges to the spiritual and communal foundations of Zulu identity, necessitating a cautious approach guided by African ethical principles.

Key Words: Artificial Womb Technology, Zulu Indigenous perspective, motherhood, *Isintu*, Childbirth.

ACRONYMS AND ABBREVIATIONS

AWT	Artificial Womb Technology
DECA.	Describe-Evaluate-Consult-and-Act
NICU	Neonatal Intensive Care Unit
EGA.	Estimated Gestational Age
BPD	Bronchopulmonary Dysplasia
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, and others
STIs	Sexually Transmitted Infections
AP	Artificial Placenta
IKS	Indigenous Knowledge Systems
ATR	African Traditional Religion

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CHAPTER 1 INTRODUCTION AND BACKGROUND

1.1. INTRODUCTION

This chapter introduces the foundation of this research, which explores the ethical and cultural dimensions of Artificial Womb Technology (AWT) through a Zulu Indigenous lens. It provides an overview of how the study situates itself within contemporary bioethical debates that intersect with African traditions and indigenous values. The background section explores the sacred nature of reproduction within African contexts, emphasising the ancestral and social connections that shape motherhood, childbirth, and lineage. It outlines the study's motivation, emphasising the need to examine how AWT interacts with the spiritual, moral, and communal aspects of Zulu society. The chapter also establishes the research questions and objectives that guide the study, focusing on how AWT might align with or disrupt Zulu Indigenous beliefs about family, ancestry, and community.

The study provides a preview of the method and methodology, focusing on the desktop research, also known as secondary research, that will guide this study. The study provides a preview of the theoretical framework by examining *Isintu*, which will serve as a lens to evaluate the ethico-cultural implications of artificial womb technology. The chapter presents the outline of the research structure, offering a roadmap for how subsequent chapters build on each other to achieve the aim of evaluating the ethico-cultural implications of AWT from a Zulu Indigenous perspective.

1.2. Background and Motivation of the Research

African Indigenous beliefs and practices play a significant role when it comes to the understanding of pregnancy in Africa, it is viewed as sacred and has an ancestral connection (Dlamini-Myeni, 2024:52). Artificial womb technology is an emerging reproductive innovation that when employed affects pregnancy, childbirth, and neonatal care. The first development of artificial wombs occurred in 1958, when scientists introduced a thin tube into the umbilical cords of seven pre-viable human fetuses in a warmed, perfusion environment, that was connected to an oxygenator, prolonging their lives for up to twelve hours (Njane, 2022:5). The technology is used to grow an embryo outside the body of a female organism. However, it raises critical ethical, cultural, and social questions, within the African context (Njane, 2022:6). Zulu communities, like many other African societies, have their own beliefs and practices

surrounding childbirth, motherhood, and family structures (Damini-Myeni, 2024:52). Traditionally, pregnancy is not only a biological process but also a social and spiritual experience, embedded within communal values such as *Isintu* and *Ubuntu* which is human interconnectedness and ancestral respect (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022;36). The introduction of artificial womb technology challenges these longheld cultural norms and values. This potentially reshapes the meaning of motherhood, parental roles in conception, and the value placed on natural conception, childbirth, and African ancestral traditions. Issues of accessibility, social acceptance, and the role of traditional practices in reproductive health further complicate the ethical considerations surrounding artificial womb technology.

The decision to research ethical and cultural aspects of artificial womb technology from an African indigenous perspective stems from an interest in the intersection of Western biomedical ethics, indigenous knowledge systems, and African cultural values. I believe that engaging with artificial womb technology from a Zulu indigenous perspective offers a valuable critique of the assumptions of these technologies, while also emphasising the need for culturally sensitive bioethics frameworks. Discussions surrounding reproductive technologies in Africa have concentrated on issues such as infertility treatments, surrogacy, and ART, with minimal attention devoted to the potential introduction of emerging technologies such as artificial womb technology. Given the cultural and spiritual significance of childbirth in African societies, alongside the strong emphasis on communal identity, it is essential to explore the ethnocultural implications of Artificial womb technology before its widespread adoption. As an individual engaged in ethical debates surrounding development and technological innovation, I find the case of artificial womb technology to be a persuasive case study. While most of the global discourse on artificial womb technology has focused on Western biomedical advancements, gender equality, legal concerns, and reproductive autonomy, there remains a gap in exploring its implications through Indigenous African perspectives, within the Zulu cultural framework. This technology raises critical questions about how modern innovations might align with or challenge indigenous values related to family, kinship or lineage, and community. By conducting this research, I aim to contribute to the growing discourse on ethical pluralism in bioethics, ensuring that Africa's cultural, moral, and ethical frameworks are given due consideration in shaping the future landscape of reproductive health technologies.

1.3 Research Problem

The invention and development of artificial womb technology (AWT) signifies a possible transformation in human reproduction and neonatal care. The global bioethical debate on AWT has been focused on Western paradigms, emphasising reproductive autonomy, gender equality, legal aspects, and technological advancement. This discourse reveals a significant gap, as it lacks the viewpoints of non-Western and Indigenous knowledge systems. In Zulu philosophy, governed by Isintu and Ubuntu, reproduction is a sacred nexus of spiritual, ancestral, and communal continuity. Motherhood and natural conception are vital for kinship and for linking generations to the ancestors (*amadlozi*). By externalising gestation, AWT severs the embodied connection essential for transmitting ancestral blessings and communal identity.

Current studies on reproductive technologies in Africa have given minimal thought to the implications of the emerging development of artificial womb technology, which is a significant problem. The possible use of AWT, without systematic investigation, risks a conflict with Zulu Indigenous beliefs. This conflict could disrupt fundamental norms related to family, gender roles, spiritual rituals, and the understanding of life itself. Hence, there is a pressing need to evaluate the ethico-cultural implications of AWT from a Zulu Indigenous perspective to identify points of conflict, assess potential disruptions to cultural integrity, and ensure that African values inform future engagement with this technology. This study addresses this problem by focusing on a Zulu Indigenous perspective to examine the potential integration of artificial womb technology within an African cultural context.

1.4 Key Research Question

What are the ethical and cultural implications of AWT from the Zulu indigenous perspective?

1.4.1 Research Sub-Questions

1. What is Artificial Womb Technology?
2. What are the fundamental ethical and cultural beliefs surrounding reproduction, motherhood, and ancestral continuity in Zulu indigenous traditions?
3. In what ways does Artificial Womb Technology (AWT) conflict with or disrupt Zulu Indigenous reproductive norms?

1.5 Key Research Objective

“To evaluate the ethico-cultural implications of artificial womb technology from a Zulu Indigenous Perspective.”

1.5.1 Research Sub-Objectives

1. To explore the Artificial womb technology, the ethical and cultural beliefs surrounding reproduction, motherhood, and ancestral continuity in Zulu indigenous traditions.
2. To analyse the potential ethical and cultural conflicts between Artificial Womb Technology (AWT) and Zulu indigenous reproductive norms, gender roles, and spiritual beliefs.
3. To examine how the theory of *Isintu* can inform the ethical implications of Artificial womb technology.

1.6 Preview of Method and Methodology

This study employs desktop research, also known as secondary research, to gather and analyse existing data from sources such as academic articles, journals, and books, providing context. The study will use a descriptive, exploratory qualitative design to investigate the ethico-cultural implications of Artificial Womb Technology for Zulu society. The research explores the implications of an emerging technology in African societies, enabling an examination of how AWT may intersect with cultural, ethical, and spiritual dimensions in Zulu communities. The research is guided by the DECA approach, which stands for Describe, Evaluate, Consult, and Act, offering a structured process for outlining the ethical issue, assessing its implications using culturally grounded perspectives, consulting relevant academic and Indigenous sources, and proposing culturally informed actions. The study employs the theory of *Isintuism*, which centres on Indigenous values, communal identity, spiritual continuity, and ancestral connection, to evaluate the ethico-cultural implications of AWT, such as the disruption of ancestral roles in pregnancy and childbirth. The study aims to provide a comprehensive overview of the ethnocultural concerns surrounding artificial womb technology and to inform future engagements with this emerging development in ways that respect Zulu Indigenous values (see Chapter 3).

1.7 Preview of Theoretical Framework

This study is guided by the theoretical framework of *Isintuism*, an Afrocentric paradigm rooted in the philosophy of *Ubuntu*, which provides a culturally grounded lens for evaluating the ethico-cultural implications of Artificial Womb Technology (AWT). The framework centers on the fundamental principles of *Ubuntu*, emphasising humanity and interconnectedness. *Isizwe* explores lineage and ancestry, as well as *Umhlaba*, including its ecology and the sacred, asserting that personhood is a communal and spiritual status achieved through social integration and ancestral sanctification, rather than a biological event. This study will employ *Isintuism* to analyse how AWT potentially disrupts sacred Zulu reproductive norms, spiritual continuity, and communal harmony by externalising gestation, thereby challenging the sanctity of the womb (*isibeletho*), interfering with essential rituals like *imbeleko* and *inkaba*, and alienating the individual from the ancestral and natural orders that are foundational to Zulu identity and moral life, see context in (Chapter 4).

1.8 Outline of Chapters:

The first chapter introduces the research by establishing the foundation for exploring the ethical and cultural implications of Artificial Womb Technology (AWT) through a Zulu Indigenous lens. It presents the research problem, identifying a gap in Western-centric bioethical discourse and the potential for AWT to disrupt Zulu spiritual, ancestral, and communal norms surrounding reproduction. Finally, the chapter outlines the study's key questions, objectives, and previews the desktop methodology and *Isintu* theoretical framework that will guide the analysis.

The second chapter reviews existing scholarly literature to establish a foundational understanding of Artificial Womb Technology (AWT), its potential benefits, and the legal concerns it raises from a Western bioethical perspective. The chapter then reviewed literature on African understandings of reproduction, focusing on Zulu Indigenous perspectives, which are deeply spiritual and communal. The chapter concludes by identifying a significant gap in the literature, how AWT interacts with, challenges, or aligns with the specific ethico-cultural values and spiritual beliefs of Zulu society.

The third chapter looks at the method and methodology of the study, guiding the investigation of the ethico-cultural implications of Artificial Womb Technology from a Zulu Indigenous perspective. The chapter describes how the research will be conducted, justifies the choice of design and approach, and ensures that the study's objectives are achieved in a manner consistent with sound academic and ethical principles. It provides a rationale for the research

design, data sources, analytical procedures, and the philosophical assumptions underpinning the study.

The fourth chapter explores the theoretical framework that will guide this study. The chapter establishes *Isintuism*, an Afrocentric paradigm rooted in *Ubuntu*, as the theoretical framework for the study. It outlines the core principles of *Isintuism*, such as communalism, ancestral respect, and the interconnectedness of life, which form a holistic Zulu worldview. The framework will guide the analysis by evaluating how AWT disrupts these principles, focusing on communal personhood, spiritual lineage, and the sanctity of natural processes.

The fifth chapter provides an in-depth analysis of the ethico-cultural implications of Artificial Womb Technology (AWT) from a Zulu Indigenous perspective, using the theoretical framework of *Isintu*. It critically examines how Artificial Womb Technology challenges and disrupts core principles of *Ubuntu*, focusing on humanity and community, its implications on *Isizwe*, exploring lineage and ancestry significance, and *Umhlaba*, emphasising ecology and the sacred, arguing that the technology disrupts sacred relationships, rituals, and the spiritual continuity integral to Zulu identity. The chapter emphasises the need for a balanced approach that respects and preserves Indigenous cultural and ethical systems.

Chapter six provides a summary of the key components of the research and reflects on the ethico-cultural implications of artificial womb technology from a Zulu indigenous perspective. The chapter recommends developing ethical and cultural principles for the adoption and regulation of artificial womb technology, ensuring its implementation aligns with Zulu indigenous values, moral principles, and the community's well-being. The chapter concludes with a discussion of the potential of artificial womb technology in Africa.

1.9 CONCLUSION

In conclusion, this chapter has introduced the study's central focus, outlined its objectives, and provided a clear framework. It has situated artificial womb technology within the broader discourse of ethics, culture, and African Indigenous thought, within Zulu traditions that view reproduction as both spiritual and communal. The chapter has underscored the importance of evaluating emerging technologies through Indigenous frameworks to ensure that biomedical innovation respects African values and worldviews. It has also presented the research questions and objectives that guide the study, along with a chapter outline that outlines the study's structure. The next chapter will review the existing literature on artificial womb technology,

explore the debates surrounding its introduction, and provide context on the concept and nature of this technology.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter introduced and provided the background for this study by outlining the concept, history, emergence, and scientific development of artificial womb technology. It presented the background and motivation of the study, focusing on how African Indigenous beliefs and practices among the Zulu provide a distinct ethical and cultural perspective on the perception of pregnancy, motherhood, and reproduction. The previous chapter explored the research question and objective and outlined the chapters. This study presents a literature review in a thematic format, offering a clear and organised discussion of the main ideas and debates surrounding artificial womb technology. The themes include the understanding of the African Indigenous perspective on reproduction, the Zulu perspective on reproduction, defining artificial womb technology, and the benefits and legal concerns of artificial womb technology. This chapter will review existing scholarly literature on artificial womb technology. It aims to examine the foundational concepts of artificial womb technology and explore African cultural and indigenous perspectives on reproduction.

The review will draw on African scholars such as Omolola et al, Oduwole et al, and Adebayo et al (2023) to argue that African belief systems shape the conception of reproduction in African societies, and on Ndlovu and Ngema (2022), who explore the Zulu understanding of reproduction and emphasise traditional norms. The review will draw on key scholars whose work focuses on artificial womb technology, namely Romanis (2020, 2021, 2023, and 2024), who looks at the legal and ethical challenges of ectogenesis, Horn (2022), who examines how artificial womb technology connects to issues of gender and reproductive justice, and De Bie (2023) who argue that artificial womb technology raises critical ethical questions about the moral status, rights, and best interests of the fetus, emphasising the need for careful ethical guidelines as the technology develops. Njane (2022) argues that artificial womb technology could save premature babies' lives in Kenya, but it must be carefully regulated to protect human dignity. Omolola et al, Oduwele et al, and Adebayo et al (2023) explore ectogenesis as a potential response because it holds the promise to provide an alternative path to parenthood for

those facing fertility challenges in Africa. Medori and Bonetti (2023) examine the ethical, medical, and societal implications of developing and implementing artificial placenta systems and artificial womb technology, arguing that while artificial wombs improve the survival rates of premature babies, they also raise significant bioethical concerns. Dr. A. Shaji George (2023) holds that AI systems could be used to develop more efficient methods for creating ectogenesis embryos within laboratory settings. Veres (2021) examines the ethical and theological implications of partial ectogenesis, which is the process whereby a fetus is gestated partially inside a woman's womb and partially in an artificial womb.

2.2 Understanding African Indigenous Perspective on Reproduction

In African societies, traditional beliefs shape the perception of reproductive technologies, fertility, and delivery as community rather than individual behaviours. Among the Yoruba people, Omolola, Oduwole, and Adebayo (2023:6) claim that motherhood is one of the most ingrained cultural virtues in African countries. It is regarded as a sacred event that symbolises the inherent worth and status of a woman. These societies, in their view, place great importance on the distinction between childbirth and motherhood, which encourages a woman's continued responsibility to raise and care for her child after giving birth. Infertility has serious social repercussions in Africa, where having children is valued, and motherhood is seen as crucial to a woman's standing in society (Diko, 2025:3). Women may experience verbal abuse, social marginalisation, stigmatisation, allegations of witchcraft, and a loss in their status in society. According to Dickson (2024:368), traditions such as the symbolic gesture of tapping the pregnant stomach, which emphasises the spiritual bond between the mother and the unborn child, further sanctify the maternal journey. According to Dickson (2024:368), infertility and barrenness are historically stigmatised, and society stigmatises people who experience them; this is still the case in many African communities. Some individuals hold the belief that childlessness is a curse originating from the person's spirit or from their evil conduct. There is a significant emphasis on the severe stigma associated with infertility in African contexts (Omolola et al, Oduwole et al, and Adebayo et al, 2023:3). In African societies, there is a cultural desire for children to carry on the lineage and honour ancestors. Life is a sacred gift from the ancestors, and its processes should not be disregarded. The methods employed to achieve pregnancy are as significant as the outcome itself. According to Omolola et al, Oduwole et al, and Adebayo et al, any curse or incantation of the child is associated with the mother; hence, the womb becomes a sacred space.

Nnachi et al, Nwinya et al, and Ogoko et al (2024:86) cited Mbiti, who asserts that, in the Igbo/Nigerian perspective, as in other African nations, children are perceived as the connective bond between the living and the deceased, as well as the assurance of familial continuity across generations. In many cultures, it is considered a great tragedy for someone to pass away without leaving a child or close family member to remember them or pour libations in their honour. According to Nnachi et al, Nwinya et al, and Ogoko et al (2024:86), a man would stop at nothing to have his own offspring. Yoruba civilisation, which emphasises the holistic character of pregnancy and its cultural beliefs and traditions, integrates the physical, spiritual, and communal components of pregnancy (Omolola et al, Oduwole et al, & Adebayo et al, 2023:7). The mother is the central and most vital aspect of a pregnancy, as the well-being of the unborn baby depends on her health. In Africa, there exists substantial endorsement for cultural childbirth practices that enable women to assume maternal upright positions, including kneeling and squatting, which are influenced by their instincts and cultural traditions (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022:2). Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al (2022:2) state that women were giving birth in several positions, such as sitting, standing, squatting, kneeling, and utilising their hands and knees and the left lateral position. These practices exemplify the recognition that birth is a natural and sacred process, emphasising the significance of cultural traditions in pregnancy. According to Nnachi et al, Nwinya et al, and Ogoko et al (2024:86), these customary practices promote the healthy development of the unborn child, support the child's growth into a healthy and strong individual, and facilitate an uncomplicated and safe delivery.

2.3 Understanding the Zulu Indigenous Perspective on Reproduction

The Zulu indigenous perspective on reproduction is deeply spiritual and communal. Zungu (2020:143) asserts that for Zulu people, early-stage pregnancy must be concealed due to concerns about witchcraft, as it is believed that such secrecy protects the pregnancy from evil entities caused by envious individuals. Pregnancy restrictions are implemented to align with natural cycles and require adherence to specific guidelines that safeguard the well-being of both the mother and the child. The belief system acknowledges that failing to adhere to instructions can have spiritual implications that interfere with natural processes and result in complications (Masilo, 2022:44). The womb, referred to as '*isibeletho*,' is regarded as a sacred space that serves as a vessel of ancestral power, facilitating the creation of life under ancestral guidance (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022:104). The womb serves as a sacred space for nurturing and sustaining life; the woman's womb ensures the effective

implementation of traditional and cultural practices significant to Zulu society (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022:58). Within this worldview, Zulu perceptions of life are regarded as a sacred gift (*isipho sabaphansi*), shaped by ancestral influence and biological processes (Gugulethu, 2025:305). Reproduction is both a biological and spiritual obligation for the Zulu, and giving birth (*ukuzala*) honours and sustains the familial lineage (Gugulethu, 2025:305). Within the indigenous Zulu worldview, pregnancy and childbirth transcend mere biological occurrences, embodying sacred processes that establish a connection between the prenatal child and the vital force influencing all existence and coursing throughout the entire universe (Mkhize, 2018:28). This perspective regards reproductive experiences as spiritual journeys necessitating careful consideration of natural cycles and ancestral guidance (Ephirim-Donkor, 2021:27), a view supported by the fact that rituals for conception and birth show that ancestors have been a part of the child's life from the time of conception (Ohaja & Anyim, 2021:3). This creates an environment where pregnancy and childbirth are seen as divine and need to be protected and recognised through ceremonies (Ohaja & Anyim, 2021:3).

The process of reproduction is intricately connected to spiritual and ancestral values; conception and delivery are not merely physiological occurrences but are regarded as sacred rituals performed by past generations (Gugulethu, 2025:304). This perspective is communal, as from conception, the child is viewed as a member of the entire society, not just its biological parents, with the community sharing responsibility for the child's upbringing (Twikirize et al, Tusasiirwe et al, and Mugumbate et al, 2023:167). According to Tshivhase & Moyo (2025:7), the idea that "it takes a village to raise a child" applies to pregnancy and birth. A child belongs to the whole community, not just the immediate family (Tshivhase & Moyo, 2025:7). This collective responsibility is active, as throughout gestation and delivery, this manifests in collective customs wherein the community as a whole or extended family actively participates in the birthing process (Mulkey, 2024: 51).

2.3.1 Zulu Marriage and Reproductive Expectations

According to Nkosi et al, O'Neil et al, Cele et al, and Thethwayo et al (2024:44), in Zulu societies, marriage is viewed as a sacred connection between two families rather than between two individuals. It solidifies alliances between families and ensures the continuity of *'umndeni*, referring to the family clan and lineage. According to Ntshangase (2021:8), the process is initiated and legalised through the payment of bride price, known as *'ilobolo'*, a practice in

which the groom's family transfers assets, such as traditional cattle, to the bride's family. According to Ntshangase (2021: 8), the bride price is a contractual covenant that secures the legitimacy of the union, formally transfers the rights and responsibilities of children to the father's lineage, and establishes a lasting bond of mutual respect and obligation between the families. According to Ndlovu and Ngema (2022:18), for Zulu people, procreation is the primary expectation after marriage and the uniting of the two families, as children are seen as the ultimate satisfaction of marriage, essential to preserving the ancestral line and providing their parents and elders with social and spiritual stability.

According to Mkhize (2018:28), in the Zulu worldview, reproductive events transcend mere biological occurrences, embodying sacred processes that establish a connection between the child and the vital force that influences all existence and courses throughout the entire universe. This perspective views reproductive experiences as spiritual journeys that require careful consideration of natural cycles and ancestral guidance (Ephirim-Donkor, 2021:27). For Gwacham & Thomas (2021:483), the mother's journey is supported and shared by her immediate and extended family as well as the community as a whole during pregnancy and delivery. From conception, the child is viewed as a member of the entire society, not just its biological parents, with the community sharing responsibility for the child's upbringing (Twikirize et al, Tusasiirwe et al, and Mugumbate et al, 2023:167). Ngema et al, Calvino et al, and Matadi et al (2024:64) assert that in Zulu cultures, a woman's capacity to conceive is an essential factor for assessing the success of a marriage. Ushe (2018: 171) states that children (*izingane*) are valued not only for their social and economic contributions but also for their spiritual importance; they are regarded as blessings from the ancestors (*amadlozi*). According to Ushe (2018:171), the inability to conceive is perceived as a lack of ancestral blessing on the marriage, resulting in the couple not having children.

Ntshangase (2021: 8) argues that in Zulu cosmology, a childless marriage is viewed as a significant crisis that threatens the core elements of family structure. This signifies a disruption in the continuity of existence, interrupting the connection between ancestors and the living, which carries severe spiritual consequences (Gugulethu, 2025:304). Ndlovu and Ngema (2022:15) assert that in the Zulu cosmology, when a woman is unable to conceive, she is subjected to various forms of persecution, including humiliation, suffering, and neglect from her spouse. A barren wife is called many names, and her incapacity to conceive is linked to witchcraft, womb deformity, previous abortions, and a promiscuous lifestyle before marriage (Ndlovu and Ngema, 2024:15). Infertility is often viewed as an indication of ancestral

displeasure or anger. Memela (2022:36) states that this spiritual dilemma puts pressure on the couple to pursue intervention from traditional healers (*izangoma*) to get to the root of the spiritual cause of infertility, as the absence of children calls into question the legitimacy of the marriage and the future of the lineage.

2.3.2 Infertility and Spirituality in Zulu Reproduction

Within the Zulu indigenous worldview, fertility and infertility are understood through an integrated spiritual and biological process. Fertility is acknowledged as a spiritual occurrence that necessitates intervention techniques from supernatural forces (Vargas, 2025:1). Traditional beliefs recognise that infertility is perceived as both a biological issue and a spiritual matter, wherein ancestral blessings or interventions are believed to be withheld if appropriate relationships with natural and spiritual forces are neglected and not honored (Diko, 2025:3). According to Nguekeu (2022: 105), for Zulu people disobedience to the ancestors was thought to provoke their anger, resulting in punishment, which might include preventing pregnancy. Shivambo et al, Ntsie et al, and Shaik et al (2025: 6) cite Mashamba (2009), who argues that in Zulu cultures and traditional healthcare, infertility is traced to ancestral curses, witchcraft, and evil spirits, as well as to the incorrect burial of the umbilical cord, among other factors. The women may have difficulties in conceiving or may suffer miscarriages due to witchcraft performed on them. Qwabi et al, Shivambo et al, Ntsie et al, and Shaik et al(2025: 6) assert that witchcraft is performed through placing '*muthi*', which are evil herbs, at the entrance to a woman's house. Once a woman steps into that '*muthi*', it ascends her legs, penetrates the uterus, and destroys what is intended to be a fetus, causing a miscarriage. The practice of witchcraft is tied to the importance of children in Zulu society, as they are essential for continuing the family lineage, providing practical support for parents in their old age, and maintaining the vital spiritual bridge between the ancestors and the living (Nguekeu, 2022:105).

Within the Zulu societies, male infertility has traditionally been managed as a discreet familial matter, resolved through internal mechanisms such as *ukungenwa* to ensure social continuity while safeguarding the lineage from external stigma. According to Memela (2022:36), in certain Zulu cultural practices, the solution of male infertility involved a practice known as *ukungenwa*, a type of customary surrogacy in which a male relative, the infertile husband's brother, is allowed to sleep with his brother's wife and father the children. This practice was not considered adultery, but rather a cultural practice to ensure the continuation of the lineage (*umndeni*) and the wife's social status within the marital home (Memela, 2022:36). According to Ntshangase (2022:37), despite the gradual decline of the cultural tradition of *ukungenwa* or

ukungenwa, it continues to be practiced in many societies across present-day Africa. Children born from such a union are legally and socially recognised as the married couple's biological children, preserving the family lineage and inheritance rights. This custom exemplifies the strong cultural emphasis of traditional Zulu social structures on procreation and ancestral continuity (Memela, 2022:61). Ntshangase (2022:39) asserts that in the past, Zulu communities would engage in the traditional practice of *ukungenwa* or *ukungenwa* with the sincere goal of continuing the legacy and safeguarding the deceased's family and wealth.

Ushe (2018:171) asserts that the spiritual framework of the Zulu is central to understanding reproduction, as ancestors are regarded as direct sources of a successful life, good health, children, and prosperity. They are viewed as a bridge between the living and the spiritual, having the power to affect the well-being of both people and communities (Diko, 2025:3). Ancestors are considered the protectors of a community, influencing moral conduct of individuals, families, and society as a whole (Goeieman, 2022:14). Goeieman (2022:11) asserts that ancestors are regarded as givers of life, blessing their descendants with children, assist in significant decision-making, and participate in crucial life events. They play a vital role in conception, pregnancy, childbirth, and guide the safe passing of a child to the physical world. The womb, referred to as '*isibeletho*,' is regarded as a sacred space that serves as a vessel of ancestral power, facilitating the creation of life under ancestral guidance (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022:104). The womb serves as a sacred and spiritual space for nurturing and sustaining life; thus, the absence of a woman's womb hinders the effective implementation of traditional and cultural practices significant to Zulu society (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022:58). Ushe (2018:171), the ancestors watch over their descendants, promoting their happiness and welfare while ensuring overall well-being. They are regarded as direct sources of a successful life, good health, children, and prosperity.

2.3.3 Zulu Traditions and Practices Regarding Reproduction

According to Diko (2025:3), in Zulu societies, rituals, prayers, and sacrifices are used to seek the mediation of these ancestral figures, who not only uphold the moral order but also serve as sources of blessings, protection, and direction. Diko (2025:3) states that this is exemplified in specific traditional practices surrounding birth. Through a lifetime of initiation, in which a variety of ceremonies and rituals are carried out to fully integrate the person into the social and spiritual culture of the society, this belief is actualised (Ndlovu, 2021: 221). As a result, the

community is involved in helping the child realise their potential and identity. For Zulu people, rituals for conception and birth show that ancestors have been part of the child's life from the moment of conception. This creates an environment where natural processes are seen as divine and need to be protected and recognised through ceremonies (Ohaja & Anyim, 2021:3). According to Ramaube et al, Du Plessis et al, and Mogale et al (2022:41), in many ethnic groups in South Africa, the ritual ceremony *imbeleko* is conducted to introduce and welcome a newborn infant into the family and the ancestral clan, seeking their blessing and protection while affirming the child's position within the lineage. This ceremony involves cultural customs that include killing an animal, such as a goat, to honor or elevate the spirits of ancestors and foster a sense of community (Ramaube et al, Du Plessis et al, and Mogale et al, 2022:41). Following the ritual, a band made from the goatskin is tied around the infant's wrist, act referred to as '*isiphandla*' as a way to introduce and link them to the ancestors (Ramaube et al, Du Plessis et al, and Mogale et al, 2022:41). This implies that the individual is a member of the family and a member of the ancestors (Ramaube et al, Du Plessis et al, and Mogale et al, 2022:42). The mother's participation in this ritual is also deeply symbolic; she partakes in *intsonyama*, a special piece of meat from the right front leg of the slaughtered animal (Makupula, 2019:88). According to Makupula (2019:89), the mother consumes a portion of '*intsonyama*' to express gratitude to the ancestor spirits for safeguarding both the infant and the mother, as performing ritual ceremonies serves to express gratitude to the ancestors for their protection of the child.

According to Matholeni (2019:430), the custom of burying the cord and placenta, known as '*Inkaba*', is significant to the clan and ensures that the child remains forever attached to her ancestral lands. This custom acknowledges that *Inkaba* thus becomes a symbol of one's ancestral home, representing the connection between oneself, one's clan, the land, and the spiritual realm (Matholei, 2019: 430). When the ritual is not performed, it is believed that the child will continue to wet the bed and exhibit disobedient behaviours. According to Zungu (2020:145), performing ritual ceremonies expresses gratitude to the ancestors for protecting the initiates. In various African cultures within South Africa, the birth of a firstborn child is a significant event that elevates the status of the parents (Makupula, 2019:89). To protect and preserve the natural processes that occur during pregnancy, the Zulu people use protective taboos such as the belief that early-stage pregnancy must be concealed due to concerns about witchcraft (Zungu, 2020:144). Indigenous customs following conception entail immediate

protective actions; upon confirming pregnancy, specific obligatory remedies, including Joko tea, are prepared to safeguard against spirits that are evil and witchcraft (Masilo, 2022:47).

Gugulethu (2025:304) states that the use of medicinal plants like '*Umhlonyanane*', which refers to an *Artemisia*, helps improve women's reproductive health.

Gugulethu (2025:305) asserts that the ritual of '*ukuphahla*' is the process of communicating and pleading with the ancestors. This ritual further reinforces the ancestral relationship by allowing family members to communicate and plead with the ancestors for protection, health, and prosperity after the birth of a child (Gugulethu, 2025:305). The family pleads with their ancestors to bless them with children to continue the family's lineage. According to Ndlovu and Ngema (2022:15), in Zulu societies, failure to conceive can be viewed as a punishment from the ancestors; hence, the family results in slaughtering an animal and burning incense to plead with the ancestors. Ushe (2018:171) supports a similar view, asserting that in Zulu culture, children are of significance; the birthing and naming of children are common reasons why the living-dead communicate with a family member. The name of a deceased person reflects their good character and will be passed down to future generations. Ushe (2018:171) asserts that the wrong naming of a child can lead to illness or even death. The child, without identification, is excluded from the community and is not regarded as a human being.

2.4 Defining Artificial Womb Technology (AWT)

Cavolo (2025:1) defines artificial womb technology (AWT) as systems capable of sustaining gestation, either partially or entirely, within an artificial uterine environment external to the human body. George (2022:117) defines an artificial womb as a "biobag" or ectogenetic system, a device that facilitates a suitable environment for human embryos to develop externally from their mother's body. Cavaliere (2020:1) asserts that trials with non-human animals have shown that creatures like lambs may be extracted from the maternal womb and placed in '*biobags*' that replicate the conditions of late-stage gestation. The artificial womb comprises two essential components: a chamber for nutrition and another for waste removal (Moderi, 2023:244). Artificial amniotic fluid is introduced into the nutrient supply chamber to sustain the developing fetus within the womb. The system includes a container that continuously delivers pure, oxygenated blood to the fetus until delivery, facilitating optimal growth and development at the optimal temperatures within the womb. Pumps circulate warm water to regulate body temperature (Medori, 2023:244).

Segers (2021:2) asserts that artificial womb technology refers to the technological aspect of the process known as 'ectogenesis,' which encompasses the partial or entire gestation of a developing embryo or baby outside the human body. He characterises total ectogenesis as gestation occurring entirely outside a human body, from conception to birth. He asserts that partial ectogenesis can be categorised into two views. Partial ectogenesis, in one view, denotes the relocation of a partially developed embryo or fetus from the female body to an external womb for the continuation of the gestation period (Segers, 2021:2). Partial ectogenesis is methods commonly employed in neonatology, such as incubators for the care of preterm infants, and in reproductive medicine, exemplified by in vitro fertilization (Segers, 2021:2). According to Romanis (2023:94), AWT should not be regarded as a substitute for all pregnancies, but rather as a feasible alternative to neonatal intensive care. While complete ectogenesis is not an immediate future, Romanis (2023:94) posits that partial ectogenesis, which involves the development of a human being in an artificial womb for a portion of the standard gestational period, may be achievable. Both Segers and Romanis anchor their analysis in the critical distinction between partial and complete ectogenesis, establishing AWT not as a singular intervention but as a spectrum extending from established neonatal care or incubators to a speculative future of complete external gestation.

2.4.1 Pre-Clinical Testing of Artificial Wombs Using Lambs

Yaakob (2022:2) reports that a significant experiment occurred in 2017, where researchers from the Centre for Foetal Research at the Children's Hospital of Philadelphia, USA, successfully gestated premature lambs, delivered after 110 days of gestation, in an artificial womb composed of a fluid-filled plastic bag. Peers de Nieuwburgh et al, Dave et al, and Khan et al (2024:1617) cited Partridge et al, Davey et al, Hornick et al, and McGovern et al (2017), who indicate that the preliminary number of experiments was conducted on late gestational lambs, 125 to 140 days of gestation, and employed an open fluid bath with continuous recirculation of an electrolyte solution, engineered to replicate amniotic fluid using micropore filters. Wozniak and Fernandes (2021:1) indicate that to address concerns about sterility, size adaptability, and spatial and fluid-volume efficiency, a 'biobag' design was developed. This single-use, fully enclosed system reduces amniotic fluid volume and can be tailored to mimic the uterus's size and shape. Wozniak and Fernandes (2021:1) assert that a biobag comprises a translucent, sonolucent, and flexible polyethylene film, facilitating the tracking, scanning, and manipulation of the fetus as required. Peers de Nieuwburgh et al, Dave et al, and Khan et al (2024:1617) indicate that an open, sealable side was integrated to enable fetal insertion during cannulation,

and multiple watertight ports were engineered to fit cannulas, temperature probes, and sterile suction tubing. Peers de Nieuwburgh et al, Dave et al, and Khan et al assert that, after cannulation, the Biobag is closed off and relocated to a movable support platform equipped with temperature and pressure management, cushioning, fluid reservoirs, and fluid exchange circuitry (2024:1624). The creation of the Biobag addressed the issue of significant fluid contamination and has eradicated pneumonia in lung pathology. Romanis (2021:826) states that recent animal tests using artificial womb prototypes have shown that partial ectogestation in lambs may be facilitated, which led to debate over the advancement of this technology and its effects.

Usuda et al, Watanabe et al, Saito et al, and Musk et al (2019:7) cited Partridge et al, Davey et al, Hornick et al, and McGovern et al (2017), who conducted a study involving eight lambs while maintaining consistent circuit flow values similar to those typically found in the usual flow to the placenta. Usuda et al, Watanabe et al, Saito et al, and Musk et al (2019:7) state that the authors conducted experiments on five fetuses from 105 to 108 days of gestation for durations of 25 to 28 days, and three fetuses from 115 to 120 days of gestation for durations of 20 to 28 days. The longest observations were terminated at 28 days due to animal protocol restrictions, rather than any indication of instability, suggesting that support for these early gestational animals could be sustained beyond four weeks. Romanis (2021:826) asserts that the gestating entity inside an artificial womb does not undergo any biological adaptations for ex utero existence, since it continues to be a subject of gestation. The gestational and fetal processes are distinct from those of any existing human, both in terms of gestational age and capabilities. Yaakob (2022:2) cited Romanis (2020), who asserts that experts are now confident that artificial wombs will be ready for human testing within the next five to ten years, between 2025 and 2030.

2.5 The Benefits of Artificial Womb Technology (AWT)

Multiple factors drive artificial womb technology. These factors include health imperatives and pregnancy-related risks, advancements in neonatal care for premature infants, its role in addressing infertility and enhancing reproductive options for individuals and couples facing conception or gestation challenges, the promotion of reproductive autonomy and ethical alternatives to abortion, and the enhancement of technological progress and prospects. This section examines many experts, like George (2023), who assert that AWT may offer a superior alternative for women unable to gestate due to medical issues or as a personal preference, and contend that AWT can mitigate infertility. Gul and Elrasheed (2024) assert that the NICU

environment may exacerbate difficulties for preterm newborns. In addition to their physiological vulnerability, extremely preterm newborns endure other unpleasant and intrusive interventions. Artificial womb technology will enable preterm infants to undergo complete gestation development. Cavolo (2024) asserts that an artificial placenta might enhance reproductive freedom by expanding reproductive options and may serve as an alternative to abortion for individuals who do not want to bear a child or undergo an abortion. Ketchum (2025:3) asserts that the swift advancement of artificial womb technology signifies a revolutionary change in reproductive medicine. Veres (2021:24) argues that the ectogenetic preborn have the same moral position as a fully developed human adult, asserting that human life and personhood begin at conception. Regardless of whether the gestational period occurs in a woman's uterus or an artificial one, the preborn fetuses deserve complete moral consideration.

2.5.1 To Reduce Risks for Mothers and Preterm Infants and Improve (NICUs)

2.5.1.1 To Reduce the Maternal Death

According to George (2023:116), the primary justification for an artificial womb is that it may provide a safer alternative for women who are unable or choose not to bear a child because of health issues or personal choice. Women suffering from chronic illnesses, including diabetes and cardiovascular conditions, may safely conceive and give birth without compromising their health (Goerge, 2023:116). George holds that technological advancements promote both individual well-being and social stability. Pregnancy and childbirth problems continue to be the primary causes of mortality for women in low-resource environments worldwide (Chen et al, Yingxi et al, and Shiels et al, 2025:2). Approximately 287,000 women die annually from pregnancy-related avoidable causes, with sub-Saharan Africa accounting for 70% of these fatalities, according to the World Health Organization. Sedgh et al, Singh et al, Taqi et al, and Wittenberg et al (2025:235) state that among women diagnosed with breast and cervical cancer, two of the most prevalent cancer types among women, breast cancer cases are on the rise in some locations, making reproductive malignancies a serious concern. Mortality risk is significantly higher in low-income countries compared to high-income countries. Habte et al, Bizuayehu et al, Lemma et al, and Sisay et al (2024:2) state that for every woman who dies, many more survive. Still, they often suffer from long-term issues, including complications during pregnancy, disabilities, and psychiatric problems. Unfavourable birth outcomes may result in health issues like learning disabilities, respiratory disorders, developmental delays,

sensory deficiencies, and an elevated risk of infections and neurological disorders, which can raise morbidity and mortality among children under five (Kusolo et al, Mumpe-Mwanja et al, and Serunjogi et al, 2025:2). One of the intended benefits of AWT is to lower morbidity and mortality in these patient groups, the use of artificial womb technologies may reduce the number of pregnancy-related illnesses (Horn, 2022:7). Horn state that among the leading causes of mortality and disability for women in underdeveloped nations who are of reproductive age are pregnancy and childbirth. A lack of qualified birth attendants, restricted access to emergency obstetric treatment, and poor maternal healthcare access are just a few of the difficulties that women in low-resource environments often encounter (Hoque, 2025:52). When a natural pregnancy becomes life-threatening, AWT offers a medical chance to lessen these risks by replacing it. For instance, babies born to mothers suffering from eclampsia, placenta previa, or uterine rupture might be securely placed in an artificial womb, protecting the lives of the mother and the baby (Hoque, 2025:52).

According to Medori (2023:245), women who are unable to conceive or bear children on their own due to a sick or damaged uterus may find the artificial uterus helpful technology. Medori (2023:245) suggests that this kind of technology may help lower the chance of caesarean sections, a major procedure that has several dangers, including heavy bleeding, blood clots, and wound infections. AW technology makes it possible to do surgical treatments on the developing baby, which lowers the possibility of problems for the expectant mother, for whom these procedures carry a high risk. According to Felix et al, De Bie et al, and Kim et al (2023:73), AWT could help parents in situations where the pregnancy poses a danger to the mother's health, such as pulmonary hypertension or heart failure. It would be helpful if treatments like medication, gene or stem cell therapy, and therapy could be carried out without putting the mother at risk for morbidity. Furthermore, the technique may be employed to enhance the safety and viability of repeated, targeted prenatal treatments. By allowing gestation to take place outside the human body, AWT can change this environment and remove many of the physiological concerns connected to pregnancy (Félix et al, De Bie et al, and Kim et al (2023:73). According to Horn (2022:3), artificial wombs have drawn attention to the fact that the technology should be seen as a valuable advancement due to its ability to lessen the adverse effects of pregnancy on women's health, rather than its potential as a life-changing intervention for neonates.

Veres (2021:24) argues that the same person deserves legal protection whether they are in the womb, an artificial uterus, or outside. According to Veres, the intentional transfer of a healthy

infant from the mother's womb to an artificial womb in the event of significant medical hazards is the goal of partial ectogenesis. Therefore, choosing partial ectogenesis might be a good way to save the mother's and the baby's lives. Artificial wombs could prove beneficial for women who have experienced multiple pregnancy losses resulting from issues related to embryo implantation, as well as for those who have undergone hysterectomies attributable to uterine cancer (Veres, 2021:25). However, Romanis (2021:826) asserts that many women find pregnancy enjoyable, hence language that refers to pregnancy as "an illness," "a disease," or reinforces outdated beliefs about the natural pathology of female biology. This undermines the significance of a normal pregnancy and the women who cherish their labour and delivery experiences. Some women may consider carrying their pregnancy to term, even if doing so puts their health or life in danger (Romanis, 2021:822).

2.5.1.2 To Reduce the Death of Premature Babies

Gul and Elrasheed (2024:10806) assert that preterm birth constitutes a widespread global health issue, impacting 5% to 18% of pregnancies each year and resulting in over 15 million premature births around the globe. It is the primary cause of neonatal mortality, responsible for 75% of neonatal deaths worldwide, and is linked to considerable morbidity, including long-term developmental, cardiovascular, and metabolic disorders. Njane (2022:7), cited Gillam, who asserts that if a baby is barely alive, their life might be characterised by frequent hospital stays, excruciating medical procedures, and near-death experiences. Many preterm newborns who survive have a high probability of persistent issues that affect their quality of life; hence, there is a pressing need for innovative advancements in neonatal care. Alkhatib & Al-Shehabat (2024:63) report that almost 1.6 million deaths in 2012 were due to problems arising from premature births. Alkhatib & Al-Shehabat (2024:63) suggest that the number of preterm births is expected to continue rising. Crump states that preterm children often have undeveloped lungs and organs, resulting in respiratory discomfort, infection, or neurological disorders. Survivors of premature birth, regardless of the presence of bronchopulmonary dysplasia (BPD), exhibit a heightened incidence of respiratory symptoms often classified as asthma, along with the use of bronchodilators in early life (Crump, 2020:4). Crump (2020:4) asserts that due to the immaturity of the pulmonary and immune systems, preterm infants are more vulnerable to respiratory virus infections and associated consequences, leading to poor lung function later in life. The problems arising from preterm delivery continue to be a major contributor to morbidity and death. According to Alkhatib and Al-Shehabat (2024:64), these difficulties may require

regular and ongoing medical treatment and are often linked to or cause chronic health concerns throughout the growth and development of a fetus.

According to De Bie et al, Kim et al & Bose et al (2023:68), severe preterm birth, which occurs before 28 weeks of estimated gestational age (EGA), impacts 0.4% of newborns worldwide, as reported by the World Health Organization. With its relatively low incidence, severe preterm birth continues to be an essential contributor to newborn morbidity and death, even in developed countries. De Bie et al, Kim et al & Bose et al (2023:68) contend that gas ventilation in preterm lungs interrupts lung development, potentially resulting in survivors suffering from chronic respiratory ailments bronchopulmonary dysplasia. Infants delivered in this gray zone of viability often have significant physical morbidity, long-term neurodevelopmental delay, and behavioural dysfunction, despite rising survival rates by vital reviving and better clinical newborn care (De Bie et al, Kim et al & Bose et al, 2023:70). AWT reduces exposure to illnesses, malnutrition, and environmental pollutants that often risks pregnancies in lowresource environments by providing a safe and regulated gestation environment. According to Osmenda (2024:46), a pregnant woman's well-being, diet, or even her movements and noises can stimulate the baby in favourable and harmful ways. Njane (2022:8) then cited Lantos, who believed that a baby who was about to die ought to be given a "trial at life." They argue that it is not in a child's best interests to let them die without giving them a fair chance at life. Njane agrees with Lantos and argues that giving the fetus a chance at life upholds its inherent human dignity. The AWT allows premature newborns on the verge of viability to have a chance at life.

Gul and Elrasheed (2024:10807) assert that prematurity poses multiple risks for newborns, as preterm infants are more sensitive to severe health complications. Furthermore, preterm birth is the primary cause of infant mortality and morbidity, impacting the global neonatal death rate. This innovation has the potential to save millions of baby lives in Africa. Mengistu (2025:3) states that sub-Saharan Africa has some of the highest worldwide newborn mortality rates, with 27 fatalities per thousand live births. A significant number of these fatalities are associated with preterm birth and insufficient access to advanced neonatal care. Gul and Elrasheed (2024:10807) assert that the risks of prematurity persist beyond infancy, indicating that premature birth relates to an elevated incidence of chronic disorders in adulthood, such as cardiovascular diseases, diabetes, and hypertension. They further explain that disruption of organ system development throughout the in-utero and perinatal phases significantly contributes to these chronic health issues. Njane (2022:3) asserts that artificial womb technology can aid medical experts by enabling them to save the lives of preterm newborns

who are on the verge of becoming viable. Njane asserts that if the AWT is applied in a way that upholds human dignity, millions of young lives might be spared from the adverse effects of preterm delivery.

2.5.1.3 To Improve the Current Neonatal Intensive Care Units (NICUs)

Current neonatal intensive care units (NICUs) have limited capability to support very preterm children born before 24 weeks of gestation (Rysavy et al, Mehler et al, Oberthur et al, Agren et al, & Kusuda et al, 2021:4). Gul and Elrasheed (2024:10806) assert that advancements in newborn care have improved survival rates for very preterm babies, those born close to viability. The authors argue that the NICU environment might intensify difficulties for preterm children, and in addition to their medical vulnerability, preterm infants endure several painful and invasive procedures. These interventions, although critical for survival, often lead to adverse developmental outcomes, including future neurological deficits (Gul & Elrasheed, 2024: 10806). Contemporary neonatal care practices frequently subject infants to injuries, including ventilator-induced lung damage and infections resulting from invasive procedures, which underscores an urgent necessity for innovative solutions to enhance outcomes for preterm infants. The recent advancements in artificial womb technology may improve survival rates and health outcomes for severely preterm children by providing a more biologically supportive environment than conventional neonatal intensive care (De Bie et al, Kim et al & Bose et al, 2023:73). According to Romanis et al, Begovic et al, and Mullock et al (2021:827), ectogestation, as an alternative to neonatal intensive care, has the potential to be a valuable tool for helping pregnant women and prospective parents.

Segers (2021:3) states that AWT seeks to enhance newborn care standards by reducing morbidity and death rates in preterm babies who cannot survive with current neonatal intensive care practices. Segers asserts that this is due to the belief that current ventilation-based life support has attained an effective extent, since the physical and functional immaturity of the lungs in severely preterm fetuses is incompatible with pulmonary gas exchange (Segers, 2021:4). Medori (2023:244) states that efforts to tackle these challenges and decrease infant mortality have led to the development of artificial placenta and artificial womb technologies, which provide a conducive environment for fetal ectogestation. Gul et al, Hummad et al, Daaboul et al, and Batta et al (2024:2179) assert that the advent of AWT marks a paradigm shift in the treatment of preterm newborns and the implementation of prenatal interventions in contemporary medicine. AWT may facilitate innovative treatment strategies by creating a womb-like environment, aiding in organ development, and enabling surgical procedures during

gestation. AWT might enhance this barrier by providing a regulated, womb-like environment that replicates the natural conditions of temperature, oxygenation, and nutrient exchange, enabling the embryo to grow safely outside the human body. Gul and Elrasheed (2024:10806) hold that by mitigating the constraints of NICUs and diminishing the risks linked to natural procedures, artificial wombs have the potential to transform care for preterm newborns.

According to Gul et al, Hummad et al, Daaboul et al, and Batta et al (2024:2183), artificial womb technology eliminates the need for mechanical ventilation by creating a fluid-filled environment, which reduces the incidence of bronchopulmonary dysplasia. They assert that AWT fosters a stable and developing environment by reducing exposure to external stimuli and eliminating painful treatments. The developments enhance survival rates and long-term health outcomes, presenting a potential option for preterm newborns while alleviating the social and economic burden of treating permanent disabilities. The use of AWT in healthcare systems has the potential to transform neonatal medicine by reducing reliance on traditional incubators and enhancing survival rates for preterm infants (Gul & Elrasheed, 2024:10813). Okesanya (2024:1) states that an artificial womb has been developed to decrease the death and morbidity rates by offering ectogestation to very preterm infants with essential care. This enables a premature infant at risk of problems and potential mortality to be put in an artificial womb, facilitating enough growth and maturation to enhance its health outcomes. Gul and Elrasheed (2024:10813) argue that artificial womb technology may improve prenatal medicine. Continuous monitoring of fetal growth and development enables scientists to get new insights into genetic and developmental diseases, facilitating earlier diagnosis and intervention. This understanding may improve preventive medicine and public health programs, ultimately fostering healthier societies.

2.5.2 To Address the Issue of Infertility

Infertility, according to De Silva Maranhão et al, De Sena Melo et al, and De Araujo et al (2021:136), is the failure of a couple to achieve a clinical pregnancy after a year of consistent, unprotected sexual activity. According to Tadesse et al, Kumsa et al, Kitil et al, Chereka et al, and Gedefaw et al (2025:2), infertility affects over 186 million people globally, and 17% of people are infertile at some point in their lives. According to Feng et al, Wu et al, Liang et al, and Bin et al (2025:2), it has a significant impact on people's quality of life regardless of gender, causing problems for human fertility and birth rates, in places where there is a low desire for children, as well as several social issues like stigmatization, marital discord, and mental stress.

According to the authors, stigmatization is severe in countries where childbearing is valued in society (Feng et al, Wu et al, Liang et al & Bin et al, 2025:2). According to Whittaker (2024:2), women have trouble getting pregnant because they have fallopian tube infections and the infection that results from them. Sexually transmitted infections (STIs), postpartum infections, or infections following pregnancy loss cause these infections. According to Osmenda (2024:43), infertile couples and people may experience several severe socio-emotional repercussions as a result of involuntary childlessness. In countries that value family, attitudes toward infertility might cause people to fear humiliation and stigmatization, which can result in social exclusion (Osmenda, 2024:43).

According to Osmenda (2024:43), infertile people might also feel depressed, angry, guilty, or even grieve because, just as the living mourn the dead, the infertile grieve their inability to have children. Male factors are as frequent when analysing the causes of infertility, even though it is often thought of as a female condition (De Silva Maranhao et al, De Sena Melo et al, & De Araujo et al, 2021:136). Thus, it is estimated that 35 to 40% of the causes of infertility are female, 20 to 40% are male, and a combination of both dysfunctions causes 20 to 30%. The remaining causes are idiopathic, meaning that sterility occurs for no apparent reason (De Silva Maranhao et al, De Sena Melo et al, and De Araujo et al, 2021: 136). The first recorded instance of artificial insemination in the 1790s in England, the discovery of the hormonal regulation of ovulation that paved the way for ovarian stimulation in assisted reproductive technology, the introduction of cryopreservation methods for sperm in the 1950s, the development of in vitro methods to study mammalian fertilization, and the studies on ovarian stimulation and egg retrieval in the 1960s are just a few examples of the long history of attempts to overcome infertility, according to Tenchov and Zhou (2025:22350). According to Whittaker (2024:2), fallopian tube blockage, age, genetic, lifestyle, or environmental variables are among the reasons for infertility in low- and middle-income countries.

According to De Silva Maranhao et al, De Sena Melo et al, and De Araujo et al (2021:138), endometriosis, tubal factor, polycystic ovarian syndrome, endocrine or anovulatory, and old age were the primary causes of female infertility. On the other hand, it includes physical variables and seminal changes in men, such as varicocele, azoospermia, and infertility after vasectomy. According to Graham (2023:40), structural defects, ovulatory dysfunction, and decreased ovarian reserve are often linked to female infertility. Although they have not been proven, stress, anxiety, and depression are hypothesised risk factors. Infertility is a medical condition that impacts millions of couples worldwide (George, 2023:107). This means that

managing infertility may be difficult and that individuals who are affected by it face a variety of emotional, social, and financial implications. The causes of infertility differ between nations and regions (George, 2023:107), and age-related factors like advanced maternal age or delayed childbearing, exposure to toxins, smoking, and alcohol use, as well as medical conditions like diabetes or endometriosis, and genetic problems like chromosomal abnormalities, are some of the contributing factors. According to Yaakob (2022:10), pregnancy is an essential part of most women's lives, and as the uterus is a symbol of femininity and of women's biological differences from males, not being able to conceive may have an impact on a woman's identity. One of the primary sources of power for women in specific communities is pregnancy and childbirth (Yaakob, 2022: 10). According to Horn (2020:25), using artificial womb technology to treat infertility also benefits social and psychological health. By reviving the prospect of motherhood, AWT might aid in the restoration of mental stability and community involvement, since infertile couples often experience despair, social isolation, and a decline in their social status (Horn, 2020:25).

Given that natural fertility and conception rates decrease with age, De Silva Maranhao et al, De Sena Melo et al, and De Araujo et al (2021:142) contend that prolonged maternal age is a significant factor in female infertility. This is because women are born with a finite number of eggs that decrease in quality with each menstrual cycle throughout their lives, leading to severe losses in both quantity and quality of oocytes (De Silva Maranhao et al, De Sena Melo et al, and De Araujo et al, 2021:142). According to Osmenda (2024:43), infertility is a more negative social, mental, and physical experience for childless women than for men; however, regardless of the distinction between male and female emotion regulation needs or strategies, it is undeniable that childlessness can have a substantial impact on men as well. According to Tenchov and Zhou (2025:22347), experimental advancements such as AW technology have the potential to transform the reproductive choices available to infertile individuals by providing options for those who are unable to create their own. According to Veres (2021:23), understanding the fetus as a whole human being, deserving of moral standing and ongoing care even outside the mother's womb, is crucial. According to Gilroy (2022:169), infertility is the main reason people and families resort to assisted reproduction. However, there are two types of infertility: social and medical. While there are many causes of medical infertility, social infertility results from an individual's incapacity to conceive on their own because of life circumstances, including being in a same-sex relationship. Women with uterine factor infertility, same-sex couples, and single parents may be able to have genetically related children

with artificial womb technology if they are unable to carry pregnancies to term safely (Horn, 2020:25). Complete ectogenesis, according to De Bie et al, Kim et al, and Bose et al (2023:74), would overcome various forms of infertility and allow biological parenting without the need for surrogacy. There are different psychological distress, marital instability, and societal shame caused by infertility or pregnancy-related risks.

2.5.3 To Reduce Pregnancy-Related Psychological and Emotional Distress

Felix et al, De Bie et al, and Kim et al (2023:73) assert that AWT may also assist parents by relieving them from the distress of witnessing their premature infants connected to ventilators and intravenous lines; instead, it enables them to observe their fetuses in a calm, secure, and comparatively standard developmental setting. Mphego et al, Mokgatle et al, and Madiba et al (2025:1) state that in high-risk pregnancies, there is a substantial chance of maternal or fetal mortality, as well as a damaged state of health for both the mother and the fetus. Pregnancy constitutes a period of stress for women owing to the physiological transformations that take place, as well as the uncertainty, fears, and concerns associated with pregnancy that may result in heightened anxiety. Women with high-risk pregnancies face a variety of unpleasant emotions and psychological experiences that contribute to their stress and anxiety. According to De Bie et al, Kim et al, and Bose et al (2023:73), improving the quality of maternity and childcare services and enhancing pregnancy outcomes requires an understanding of the needs of women with high-risk conditions. The application of AWT to preventable maternal and infant mortality should be regarded not as an invasion of nature but as an extension of humanity's obligation to safeguard one another through technological advancement. The mental grief, worry, stress, and sadness connected to maternal fatalities may be significantly alleviated by artificial womb technology (Mphego et al, Mokgatle et al, and Madiba et al, 2025:1).

The potential of artificial womb technology to mitigate maternal mortality is commendable; however, it must be evaluated together with the risks associated with medical neo-colonialism (Chatzikonstantinou and Cavolo, 2025:4). The advocacy for advanced, costly solutions such as AWT in resource-limited regions may redirect essential funding and focus from equitable and culturally appropriate public health initiatives. These measures encompass training traditional birth attendants, enhancing access to basic emergency obstetric care, providing nutrition, and mitigating poverty, strategies that would significantly reduce maternal mortality (Chatzikonstantinou and Cavolo, 2025:4). Minocher et al, Mulder et al, and Ross et al (2024:2) cited Bazile et al, Rigodon et al, Berman et al, and Boulanger et al (2015), who contended that children bereaved of their mothers owing to maternal mortality often encounter social and

psychological difficulties that sustain cycles of poverty and marginalization. Stronger communities and increased human capital result from healthier births. Early medical intervention and genetic screening may be made less complicated by artificial womb technologies. According to Peng et al, Lui et al, Zhou et al, and Zhang et al (2024:2), artificial wombs may lessen the psychological and emotional burden brought on by pregnancy-related issues. Miscarriage, stillbirth, and infant mortality are very unpleasant and stressful experiences for many parents. They are linked to significant direct and indirect psychological and social consequences for women, families, and society as a whole (Smith et al, Dickens et al, & Bender Atik et al, 2020: 868). The technology of artificial wombs has the potential to decrease emotional suffering and enhance mental well-being, which is a vital, however often disregarded, aspect of public health. This can be accomplished through better reproductive outcomes.

2.5.4 To Provide an Alternative to Surrogacy and Adoption

According to George (2023:108), one of the many advantages of artificial womb technology is that it may provide women who have had their uterus surgically removed because of cancer or other issues more alternatives if they wish to have their own children. According to George, this innovative method allows embryos to be cultivated outside of a woman's body in a synthetic setting until childbirth. It is also possible for people who have lost or damaged wombs as a result of birth abnormalities, illness, or cancer to become the child's biological parents (Okesanya, 2024:3). Due to biological constraints, this new medical technique offers hope for a child that would not otherwise be possible (Okesanya, 2024:1). Complete ectogenesis, according to De Bie et al, Kim et al, and Bose et al (2023:74), would overcome various forms of infertility and allow biological parenting without the need for surrogacy. As a result, infertility often causes psychological distress, marital instability, and societal shame. According to Tenchov and Zhou (2025:22347), global medical advancements have influenced the use and adoption of surrogacy as a solution for infertility and reproductive issues (Tenchov and Zhou, 2025:22347). However, Adamson et al, Armstrong et al, Cheong et al, and Damato et al (2024:7) state that surrogacy therapies have a significant effect on patients' physical and emotional health. It may be difficult for patients to acknowledge their condition and accept that they cannot carry their own children (Adamson et al, Armstrong et al, Cheong et al, & Damato et al, 2024:7). When traditional reproductive treatments such as surrogacy have failed, artificial womb technology provides an innovative technological solution for infertile people and couples.

According to George (2023: 116), this new advancement of AW technology may help overcome some of the most frequent obstacles that people looking for adoption or surrogacy encounter, such as long waiting times for adoption, challenges in locating qualified surrogate mothers, and concerns about pregnancy complications. Surrogacy, while helping with gestational infertility, presents several difficulties. According to Kennedy (2023:644), AWT replaces surrogacy since it only permits pregnancy to be carried by another individual, which adds to a debate that raises complicated concerns about parenting and surrogates' rights, the possible exploitation of women's bodies, and the commercialisation of human reproduction. Supporting this, Osmenda (2024:54) claims that surrogacy may turn women's bodies and children into "commodities" that can be bought and sold, and that surrogate children may have ambiguous or contradictory legal status, in situations involving foreign countries. According to Osmenda (2024:54), AWT may be able to resolve these problems by doing away with the necessity for human surrogates, which would imply that no woman's body would have to be utilised during gestation.

George (2023:116) states that by removing the possibility of surrogate mother exploitation, artificial wombs provide an ethical substitute in situations where surrogacy is prohibited by law. George further asserts that for individuals who have faced difficulties in awaiting a response from an adoption agency or in locating an appropriate surrogate mother, this innovative technological advancement provides a sense of hope. Without any of the health risks connected to traditional pregnancies, the artificial womb would provide people or couples greater control over their personal situation. According to Horn (2020:26), this potential expands inclusiveness and reproductive autonomy, enabling the emergence of many family forms. George (2023:116) further claims that because there would be no actual birth, artificial womb technology would eliminate the need for expensive medical procedures related to surrogacy arrangements; instead, embryos would be incubated in an artificial environment until full gestation.

2.5.5 To Address the Broader Demographic Issues

Artificial womb technology has implications for addressing broader demographic issues. According to George (2023:110), the future artificial womb is a revolutionary technology that may change how countries and regions dealing with rapid population growth address their demographic issues. Africa currently experiences significant population expansion, whereas other parts of the globe, such as Japan, are experiencing aging populations and a decline in birth rates (Hamira et al, Atiyatna et al, Marissa et al, Sari et al, & Khairunnas et al, 2025:31). Societies with birth rates below replacement might continue to exist thanks to AWT. Therefore,

George (2023:110) argues that by offering this technology as an alternative to natural childbirth, it may enable these nations to address their declining birth rates with minimal disruption to their social structures and traditions. According to Arochukwu et al, Ike et al, Adewoyin et al, and Eludoyin et al (2025:2), AWT may encourage healthier pregnancies and more careful family planning in areas where fertility rates are high, and healthcare facilities are overburdened. Boczar et al, Dryja et al, Stawicka et al, Orzolek et al, and Solisch et al (2024:3) assert that artificial womb technology is a breakthrough in reproductive medicine that provides couples facing infertility with successful treatments and a chance to have children.

2.5.6 To Provide Alternative Options for Abortion, Women, and LGBTQ+

2.5.6.1 To provide an Alternative option for Abortion

Yaakob (2022:4) asserts that AWT can work as an alternative to abortion, and that abortion autonomy is the capacity to make choices independently of others. Respecting individual autonomy means allowing people to make informed decisions about essential aspects of their lives that should be respected and left unrestricted. The concept of autonomy has been extended to the context of human reproduction and is often referred to as "reproductive autonomy" or "procreative liberty." Reproductive autonomy is a concept with several meanings and applications. An individual's reproductive autonomy has evolved to include not just the right to abstain from having children, but also the right to have children, do and not do an abortion. The freedom to choose the reproduction methods of their choice (Yaakob, 2022:5). Cavolo et al, Boer et al, Proost et al, Verweij et al, and Gastmans et al (2024:7) cite Kennedy, who believes that an artificial placenta may improve reproductive liberty by expanding reproductive options. According to Yaakob (2022:5), a woman's right to procreate includes the right to use an artificial womb or ectogenesis if she so chooses.

In a normal pregnancy, the fetus is entirely reliant on the mother for growth and survival within her womb. While most expectant mothers do their best to safeguard their pregnancies, circumstances may arise that compromise their ability to do so. Ectogenesis is thus expected to provide a more secure and favourable environment for the fetus to reach full term. Cavolo et al, Boer et al, Proost et al, Verweij et al, and Gastmans et al (2024:7) assert that an artificial placenta could serve as an alternative to abortion for individuals who do not wish to carry a pregnancy to term or undergo an abortion. It may also mitigate social pressures to keep the pregnancy, as it can be used before the pregnancy becomes detectable. Artificial womb technology provides an alternative, enabling women with high-risk pregnancies to prioritise

their health without forgoing the opportunity to have a child. According to Okesanya (2024:2), the accessibility of ectogestation will enable some women who wish to terminate their pregnancies to exercise their reproductive rights and pursue their life goals without the need to harm the embryo, valuing and protecting the life of a fetus. Okesanya (2024:2) asserts that artificial womb technology provides a sustainable solution to the maternal-fetal conflict and could contribute to a decrease in abortion rates by providing children with a chance to live.

Horn (2022:30) asserts that abortion violates a woman's physical autonomy to force her to endure an unwanted pregnancy. Horn further asserts that an ectogenic fetus could potentially survive within an artificial womb without compromising the expectant individual's privacy by compelling her to bear the pregnancy and proposing that employing an artificial womb in such circumstances may be justified as an alternative to abortion. Horn (2022:98) referenced Jackson, who believes that AWT must stay grounded in the fact that when abortion is illegal or inaccessible, women do not prolong their undesired pregnancies, but instead turn to dangerous and unlawful abortion techniques. According to Cavolo (2024:7), Artificial Placenta (AP) may serve as an alternative to abortion for individuals who do not wish to preserve the pregnancy or pursue an abortion. It could mitigate social pressures to continue the pregnancy, as AP can be administered prior to the pregnancy becoming visible, and it might help women with high-risk pregnancies to better safeguard their health without losing the child (Cavolo, 2024:7). The primary concern is whether AWT, as a possible gestation substitute, may take away a woman's choice to abort a pregnancy by giving the baby a "non-lethal" result (Ketchum, 2025:5). Hendricks (2019:13) makes the argument that the moral rationale for abortion declines significantly if it is possible to carry a baby outside of the uterus. Roth (2021:378) argues that this rationale poses a significant risk by unfairly equating the right to abortion with the right to terminate a fetus's life. According to Roth, bodily autonomy, the right not to have one's body exploited against one's choice as a life-support system, is the foundation of abortion rights (Roth, 2021:378).

2.5.6.2. To Address the Gendered Discrimination Faced by Women

This separation of gestation from the female anatomy represents a fundamental advancement toward gender equality. Kumarasamy et al, Bowen et al, Billings et al, and Patrician et al (2025:717) argue that traditional reproductive roles have placed the physical, emotional, and social responsibilities associated with pregnancy on women. Kumarasamy et al, Bowen et al, Billings et al, and Patrician et al (2025:728) noted that many systems worldwide rely on women as the primary caregivers to address unmet needs, and they paired this with the concept of the

hidden burden, which increases gendered inequality in pregnant people's expectations and duties. Horn (2022:51) states that in patriarchal societies, the responsibility and blame for a couple's failure to conceive is often shifted onto the woman, reflecting deeply ingrained cultural and social norms that equate female identity and value with fertility. By addressing all of the social, economic, and physical costs associated with having children, this will improve gender equality and strike a balance between husband and wife. The discussion surrounding AWT and gender equity is primarily situated within Western feminist frameworks that emphasise liberating women from the "burden" of pregnancy (Horn 2022:51).

Cavaliere (2020:2) makes the case that artificial womb technology can promote equality and address inherent disparities, starting with the recognition that there are fundamental inequalities between women and men. According to Horn (2022:3), artificial wombs might improve gender equality by giving women reproductive options and lessening the negative impacts of pregnancy and childbirth. According to Cavaliere (2020:2), women's unique capability to conceive and biological differences cause a portion of the inequalities between men and women. Within many patriarchal societies, women who are infertile or "barren" often confront social stigmatisation, psychological distress, and a diminished status, as their value is linked to their biological capacity to bear children. According to Horn, artificial womb technology may do this by lessening the disproportionate responsibility that patriarchal cultures put on women for infertility. Osmande (2024:46) argues that AWT would reduce societal injustices by detaching female reproduction from the woman. By allowing women to become mothers in the same manner that men do, artificial womb technology would promote equality enabling them to enjoy the advantages of having genetically related children without the difficulties of pregnancy and delivery (Cavaliere, 2020:2). Social norms around gender and family are changing as a result of this technological revolution, which questions patriarchal presumptions about parenting and female identity.

By separating gestation from the female body, Artificial womb technology may provide women with more reproductive flexibility. A step toward achieving genuine reproductive equity, this flexibility enables women to plan children without compromising their health, education, or employment prospects. According to Cavaliere (2020:2), ectogenesis or artificial womb technology has the potential to address inequalities that are rooted in biological differences and women's distinctive ability to bear children. One may argue that women today bear the majority of the obligations and burdens of social reproduction, including the systems that sustain a society, such as childrearing, pregnancy, and domestic work. According to Cavaliere (2020:2),

by mitigating the risks associated with pregnancy and childbirth-related health issues, AWT can advance bodily autonomy and gendered health equity. Sedgh, Singh, Taqi, and Wittenberg (2025:235) maintain that empowering women to manage their fertility, whether through contraception or abortion, facilitates their ability to take charge of their life, health, and reproductive choices. This implies that women choose to have fewer children when they have reproductive autonomy and resources to fulfill their childbearing desires; as a result, reproductive technology may benefit women (Sedgh et al, Singh et al, Taqi et al, and Wittenberg et al, 2025:235).

According to Kennedy (2023:643), a parent-child relationship is often seen as a valuable accomplishment. Many reproductive technologies have been developed to make infertility easier to manage, even if it may hinder the development of genetic and gestational family ties. Horn (2023:5) posits that artificial womb technology might change the dynamics among men, women, and fetuses. Despite their differences, these two discourses are driven by a common perception of sex and gender as unchangeable and binary. According to Cavaliere (2021:6), the distinguishing characteristic of 'women' is the presence of reproductive organs that enable pregnancy, whereas the defining trait of 'men' is the incapacity to gestate a child. Cavaliere (2021:6) states that Artificial wombs are perceived as the sole method to restructure this split, enabling men to assume responsibility for gestation while allowing women to procreate without bearing the predominant cost of reproductive risk. Artificial womb technology will elevate women and change how society views them. Cavaliere (2021:6) suggests that it may also reduce the economic challenges and physical toll that pregnant women face in areas with limited access to healthcare and maternity benefits.

2.5.6.3. To Provide Reproductive Options for the LGBTQ+ Community

George (2023:116) argues that technological advancements have expanded the scope of parenthood, transforming it from a consequence of biological factors, relationship dynamics, or sexual identity into a matter of individual volition. Individuals or couples who are considering these alternatives would have the ability to exercise more control over their circumstances through the use of the artificial womb, which would eliminate any of the health hazards that are linked with natural pregnancies (George, 2023:116). Women might be free of the possible difficulties, dangers, and limitations of pregnancy, labour, and childbirth (Okesanya, 2024:3). Transgender people, single males, and same-sex couples may have access to artificial wombs or ectogenesis. According to Yaakob (2022:17-18), unmarried males may find the concept of human gestation outside the mother's body compelling, given their innate

incapacity to gestate embryos. For single males who want to have children, one way to accomplish this is by using surrogacy. Single males should be given the same possibilities as single women, who are increasingly starting their own single-parent households (Yaakob, 2022:18). Smith (2022:356) asserts that the potential use of artificial wombs as a type of assisted reproduction is of special interest to members of the LGBTQ community. This potential holds great promise for embryo research and regenerative medicine. According to Smith (2022:365), transgender women want to exercise their right to procreate by using human parthenogenesis as a means of starting a family. Accordingly, Agopiantz et al, Dap et al, Meyer et al, and Martin et al (2023:2), reproductive technology, including artificial wombs, initially intended for heterosexual couples, has subsequently evolved to facilitate parenthood for Lesbian, Gay, Bisexual, Transgender, and Queer couples and solitary individuals, reflecting a global societal shift toward civil rights for LGBT individuals within Western societies.

2.5.7 To Improve Technological Advancements

Njane (2022:30) asserts that Artificial Womb Technology (AWT) is a medical technology innovation with the potential to improve the health and welfare of preterm infants. Njane recognises the importance of artificial womb technology as a significant medical development meant to provide prenatal assistance that goes beyond what is possible in traditional neonatal intensive care units (NICUs). Artificial womb technology, according to AlJahsh (2024:1), is an innovative approach to reproductive and newborn care that aims to maintain a fetus's growth and development outside the human body. AlJahsh emphasises AWT's potential to enhance scientific understanding of early human development and notes that it can improve outcomes for preterm children and alter the concept of reproductive rights and ethics. With its applications in developmental biology, reproductive health, and medical engineering, AWT could be an innovative technological advancement in healthcare. Andonotopo (2025:12) argues that the advancement and improvement of AWT foster multidisciplinary collaboration among neonatologists, experts in maternal-fetal medicine, biologists, bioengineers, ethicists, and clinicians, creating an environment conducive to innovation. In addition to advancing technology, this type of cooperation fosters new insights that can improve healthcare systems worldwide, including those in Africa. Murphy (2018:2) notes that this technology might improve prenatal care procedures and help understand the complex process of human development. According to Ketchum (2025:3), the area of reproductive medicine is undergoing a radical change as a result of the advancement of artificial womb technology. Ketchum (2025:3) states that by simulating the physiological processes that occur during traditional

pregnancy in a biological womb, AWT enables embryos to grow in a controlled ex utero environment. Animal experiments using AWT have shown encouraging results. Researchers have begun exploring potential human applications, bringing the concept closer to clinical reality than ever before (Ketchum, 2025:3).

Artificial womb technology (AWT) creates a completely controlled ex uterine platform that can serve as a "living laboratory" for research on embryos and fetuses (Khulbe et al, Gupta et al, & Javed et al, 2023: 618). Through extracorporeal membrane oxygenation, nutrient-rich fluid circulation, and waste elimination, the device replicates the natural uterine milieu's oxygenation while enabling continuous monitoring of vital signs through implanted sensors, contributing to technological and scientific advancements (Khulbe et al, Gupta et al, & Javed et al, 2023:618). Given that the gestational environment is artificially constructed rather than naturally occurring, researchers can precisely manipulate oxygen concentration, hormonal profiles, and nutrient content, thereby observing the resulting developmental impacts. AWT enables real-time monitoring of human development without risking damage to the mother or the fetus (Romanis et al, Begovic et al, & Mullock et al, 2021: 827). For example, scientists might track the effects of specific nutrients, toxins, or medicinal treatments on the fetus at different stages, enabling more accurate and informed prenatal care practices. With AWT, human development can be monitored throughout the entire process without endangering the mother's or the fetus's health (Romanis et al, Begovic et al, & Mullock et al, 2021:827). Unprecedented findings on organ development, gene expression, and environmental factors affecting fetal health may result from this research opportunity. Because the extrauterine environment can be managed and controlled, the adoption of synthetic wombs may reduce some hazards, thereby advancing scientific reproductive innovation (Osmenda, 2024:46).

According to Njane (2022:5), this technology possesses unique qualities intended to benefit the growing fetus. It has a biobag that serves as an oxygenator attached to the lamb's umbilical cord, replacing the placenta and allowing carbon dioxide to escape. At the same time, nutrients are given to the growing fetus. Like a human fetus, the lamb breathes and swallows the warm, sterile, lab-made fluid within the bag, which acts as an amniotic sac and enables the fetus's beating heart to pump blood (Njane, 2022:5). The most recent team put the fetuses in fluidfilled bags that were sealed to reduce the risk of infection, instead of putting them in a fish tank setup with artificial amniotic fluid similar to what scientists did in the 1960s (Njane, 2022:5). The fact that sealed biobags lower the danger of infection and more resemble the natural

environment of the womb indicates that this technology has advanced significantly from the techniques used in the 1960s.

According to George (2023:111), this technology might provide a safer environment for newborns to grow and develop by allowing for a more regulated environment throughout pregnancy and delivery. Sensors that can monitor vital indicators such as blood pressure, temperature, respiration rate, oxygen saturation, and pulse are part of the concept for these growth pods (George, 2023: 111). George further asserts that these advanced sensors exemplify the growing sophistication of artificial wombs; additional features include nutrient-delivery systems that provide all essential nutrients to the fetus during gestation, as well as wasteremoval systems designed to maintain low bacterial levels in the environment. This ensures optimal conditions throughout pregnancy while mitigating risks associated with traditional approaches, such as infection or miscarriage resulting from bad hygiene habits. Andonotopo et al, Bachnas et al, & Dewantiningrum et al (2025:4) assert that the implementation of AWT may help progress relevant medical technology. Therefore, the search for AWT could enhance more general scientific and technical capabilities. Arimitsu et al, Hatayama et al, Gaughwin et al, and Kusuda et al (2025:140) assert that artificial womb technology not only provides enhanced control over prenatal care, however it can also mitigate the risks linked to conventional birthing methods, while continuing to offer an effective means of nurturing unborn children until they reach full term, an option not available in alternative methods.

By using an artificial womb, medical professionals may observe a baby's development from conception until birth without harming the mother, a significant change in scientific innovation (George, 2023:108). If the expectant parents choose an artificial womb, it might save medical expenses by reducing costly hospital stays during pregnancy and childbirth. According to George (2023:111), this innovative technology may help prevent infections and reduce the likelihood of pregnancy-related complications. The future artificial womb offers several advantages over traditional pregnancy and birth techniques, including more control over the pod's temperature and oxygen content, which may lessen developmental stress on both the mother and the unborn child. Singh et al, Dey et al, and Putatunda et al (2022:205) claim that AWT may be the ideal objective for countries that restrict reproduction to manage their populations. According to Singh et al, Dey et al, and Putatunda et al (2022:205), AWT may be the starting point for designer babies, and genetic engineering may be able to eliminate faulty genes that could eventually lead to inherited illnesses. According to George (2023:116), the artificial womb is a groundbreaking technological advancement with the potential to alter

perceptions of pregnancy and childbirth. George (2023:116) maintains that this new technical advancement offers hope to people who have struggled to find a suitable surrogate mother for various reasons or to wait for a response from an adoption agency, improving future technological innovations. Wilkinson and Di Stefano (2020:12) state that ectogestation, often known as artificial womb technology, might have several potential medical uses in the future. Singh et al, Dey et al, and Putatunda et al (2022:205) argue that a more populated area equates to a less developed economy and fewer resources. Such artificial womb technology may be used to control the male-female ratio in nations with an unequal gender ratio. Despite the many potential opportunities of artificial womb technology, it also introduces legal concerns and challenges

2.8 Legal and Societal Concerns of Artificial Womb Technology (AWT)

According to Romanis (2020: 345), the development of artificial womb technology presents legal challenges that existing frameworks are ill-equipped to address. These implications span issues of personhood, equality, and reproductive rights. A primary legal concern is the redefinition of fundamental concepts of birth, viability, and personhood. AWT defies centuries-old assumptions about pregnancy by separating gestation from the human body, introducing realities not addressed by current law (Ketchum, 2025:29). Tan Dewes (2024:6) argues that this technology questions the existing legal definitions of birth and viability, forcing lawmakers to consider new frameworks that account for the evolving limits of human gestation. The discourse on the distinct legal status of the entity undergoing ectogestation, referred to as the "fetonate," challenges the binary between embryo and infant (Romanis, 2023:94). Hisan and Romero (2023:126) caution against the potential applications of this technology in genetic enhancement or the selective gestation of embryos based on preferred traits, which could lead to the phenomenon of "designer babies." Hisan and Romero (2023:126) assert that AWT has the potential to alter the field of prenatal diagnosis and selection; however, there are no laws and regulations that regulate the conception of "designer babies," which poses a significant challenge to legal systems worldwide because it operates in a regulatory vacuum. Current laws are unprepared to address fundamental questions about the legal status of entities in AWTs, parental rights, and liability, which creates uncertainty and risk as the technology develops (Hisan and Romero, 2023:126).

According to Ketchum (2025:29), artificial womb technology is poised to reshape legal discussions on abortion and reproductive rights. There is a risk that without proactive legal safeguards, states could use AWT to rationalize new abortion restrictions by presenting it as a

non-lethal alternative to pregnancy termination, potentially eroding reproductive freedom and bodily autonomy (Ketchum, 2025:29). This also brings up complex questions regarding the legal status of the fetus in an artificial environment, parental rights, and responsibilities (Cavolo, 2024:8). Singh et al, Dey et al, and Putatunda et al (2022:207) argues that legal risks also arise from the potential for misuse and exploitation. Singh cautions that AWT could be exploited for illegal practices such as human trafficking, coercion, or the commodification of human life (Singh et al, Dey et al, and Putatunda et al, 2022:207). De Bie et al, Kim et al, and Bose et al (2023:78) assert that women in weak economic environments could face pressure to sell their eggs or engage in reproductive programs for financial gain. For Al Ahmed et al, Abadla et al, & Al Ansari et al (2024:7), there is a risk that artificial wombs could be used for cosmetic or convenience purposes to create "designer babies," thus prioritising appearance or profit. These possibilities are exacerbated by the threat of inequitable access, which could deepen global and social disparities (Al Ahmed et al, Abadla et al, & Al Ansari et al (2024:7). Singh et al, Dey et al, and Putatunda et al (2022:204) argues that if private commercial entities back artificial womb technology, executives would possess the authority to determine its application, dividing the society into those who can afford the technology and those who cannot. This means that the technology's development and deployment will be fundamentally shaped by market logic, prioritising profit, intellectual property, and shareholder return. This commercial imperative would grant private commercial executives' significant authority over its application, transforming a potential public health intervention into a stratified commodity. De Bie et al, Kim et al, and Bose et al (2023:73) assert that wealthy individuals or corporations may dominate and control AWT, leading to the exclusion of marginalized communities and worsening existing healthcare inequities. De Bie et al, Kim et al, and Bose et al (2023:73) argue that artificial womb technology must not be treated as a simple medical innovation but as experimental research requiring stringent ethical oversight, clear transfer protocols, and transdisciplinary engagement (Singh, 2022:207).

2.9 Gap in the Literature

This literature presents a comprehensive overview of Artificial womb technology, covering its definition, development, fundamental motivations, and the African indigenous perspective on reproduction. In the literature I reviewed, scholars such as Romanis, George, Njane, Cavolo, Horn, Singh, and Okesanya, among others, have examined artificial womb technology, including its development, design, and operation, as well as the potential and implications of this technology and the prospects for partial and complete ectogestation. The literature examines the potential of artificial womb technology to mitigate challenges related to infertility,

pregnancy-associated health risks, reproductive autonomy, and abortion, while also fostering technological progress. Several scholars provided significant data and insights regarding the potential implications of artificial womb technology on established gender roles and the nature of biology. The existing literature reflects a Western perspective and bioethical framework, thereby marginalising the ethical viewpoints and cultural values of African communities.

The existing studies on Artificial womb technology lack academic exploration of its interaction with African Indigenous knowledge systems. This study examines the Zulu indigenous perspective. The existing literature lacks the incorporation of African ethical theories and indigenous perspectives on life. The gap in this literature is how developing technology, such as artificial wombs, may disrupt, align with cultural norms, traditional behaviours, and spiritual beliefs about motherhood and gestation in Africa. This study evaluates the ethico-cultural implications of Artificial womb technology from a Zulu indigenous perspective, focusing on its potential impact on cultural norms, birth practices, ancestral beliefs, and concepts of womanhood. This study evaluates the ethico-cultural implications of Artificial womb technology from a Zulu Indigenous perspective, aiming to bridge existing gaps and foster a more inclusive, culturally informed discourse on reproductive technologies.

2.10 CONCLUSION

In conclusion, the literature defined the concept of Artificial womb technology, from key scholars to understand the concepts of partial and complete ectogenesis, and outlined the progress made through pre-clinical testing, with lambs, emphasising the functionality of systems like the biobag. The literature examines African indigenous perspectives on reproduction, the concept of artificial womb technology, and the motivations for its development, as presented by key scholars including Romanis, Horn, De Bie, Njane, Omolola, Medori, and Veres. The literature established a crucial foundation by exploring the African Indigenous perspective on reproduction, with a specific focus on the Zulu Indigenous worldview. It demonstrated that within these frameworks, reproduction is not an individual biological event but a deeply spiritual, communal process. The literature reviewed found that life is considered a sacred gift from the ancestors, that the womb (*isibeletho*) is a vessel of ancestral power, and that childbirth is a spiritual obligation that ensures familial and ancestral continuity. The Zulu traditional practice of *Ukungenwa*, a sacred prenatal seclusion observed by expectant mothers, is deeply woven into the cultural fabric, emphasising the spiritual and communal preparation for motherhood rooted in the natural process of pregnancy. Artificial

wombs are currently under development, with the potential to significantly transform the understanding of fetal development and the societal implications of pregnancy.

The literature examines the potential of this technology to enhance visibility of gestation, while also raising concerns that artificial wombs may be employed further to restrict women's reproductive rights and access to abortion. The authors concluded that Artificial womb technology has the potential to enhance neonatal intensive care, serve as an alternative to surrogacy or uterus transplantation, advance prenatal therapy, address infertility, improve reproductive autonomy for women and the LGBTQ+ community, address gender inequity, and facilitate pregnancy termination while preserving fetal life. However, an immediate clinical introduction is unrealistic due to numerous concerns regarding the welfare of children conceived through artificial womb technology. Romanis hold that future technological advances in reproduction could be beneficial for women; however, they could further increase challenging roles. The literature reveals that artificial womb technology creates a significant legal void, challenging fundamental concepts of personhood and viability while raising urgent concerns about reproductive autonomy, commodification, and equitable access. They argue that the complexity of ectogenesis necessitates careful consideration of ethical and legal issues, emphasizing the need to address the critical scientific studies that have identified gaps in its mechanisms. The existing literature, although comprehensive in its examination of technoethical aspects from a Western perspective, reveals a gap in its exploration of this critical cultural and ethical intersection. The literature lacks the African perspective that upholds spiritual beliefs, cultural norms, and communal values. The next chapter will outline the research methodology to be employed to investigate the ethico-cultural implications of Artificial Womb Technology from a Zulu Indigenous perspective, thereby addressing the identified gap in the literature.

CHAPTER 3 METHOD AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed the existing literature on artificial womb technology, examining its foundational concept, benefits, and legal concerns, and exploring African and Zulu cultural and Indigenous perspectives on reproduction. The chapter then identified the need for a Zulu Indigenous perspective, cultural, and spiritual context as a gap that this study aims to address.

This chapter explains the methodological framework guiding the investigation of the ethnocultural implications of Artificial Womb Technology from a Zulu Indigenous perspective. Methodology refers to the systematic and theoretical analysis of the methods applied to a field of study (Pandey, 2021: 7). It provides a rationale for the research design, data sources, analytical procedures, and the philosophical assumptions underlying the study. The purpose of this chapter is to describe how the study is conducted, justify the choice of design and approach, and ensure that the study's objectives are achieved in a manner consistent with sound academic and ethical principles. According to Creswell and Creswell (2023: 40), a practical methodology should clearly articulate how data are collected, interpreted, and analysed to answer the research question. Therefore, this chapter outlines the research design, approach, data collection methods, and analytical techniques employed in this qualitative study.

According to various studies, the research methodology refers to how the research needs to be conducted (Pandey, 2021:7). The research methodology offers a way through which the research formulates the issue at hand, the objectives, and provides the data obtained during the research process (Pandey, 2021: 7). The research design and methodology chapter centers on the outcome to be achieved in alignment with the research objectives (Pandey, 2021: 8). The methodology provides a structured approach to addressing the research problem analytically, with a focus on examining the ethico-cultural implications of Artificial Womb Technology from a Zulu Indigenous perspective. Qualitative and quantitative methods are employed in various research approaches, and the approach this study implements is a research design that integrates a systematic process and examines multiple components of the research (Djafar, 2021: 339). This chapter outlines the research strategy, research design, research methodology, data sources, and methods of data analysis applied in the qualitative study.

3.2 Research Design

For Sharma et al, Bidari et al, Neupane et al, and Sapkota et al (2023: 3), research design refers to the comprehensive plan that provides specific direction for procedures in a research project. The research design is primarily guided by a research paradigm, which is a philosophical aspect of the world or the nature of reality. It guides how it is approached to comprehend it (Sharma et al, Bidari et al, Neupane et al, and Sapkota et al, 2023: 3). Asenahabi (2019: 81) cites Creswell (2014), who asserts that qualitative research emphasises exploring and understanding the meaning that a person or group of people ascribes to a social or human problem. Qualitative research design produces data that is not quantifiable using open-ended questions, enabling the researcher to understand issues by investigating them in their own specific context and the

meaning that individuals bring to them (Asenahabi, 2019: 81), with its primary focus being to generate meaning, purpose, or reality from the opinions and experiences of participants. According to Ansari et al, Rahim et al, Bhoje et al, and Bhosale et al (2022: 1132) formulating a research design helps make correct decisions in each step of the study, assisting in identifying essential and insignificant tasks, making the research work constructive by providing detailed facts at every stage of the process, enabling the analyst to formulate the plan of the research work based on the experimental pattern, and allowing the study to be completed within a given period while facilitating the attainment of the ideal solution for the research problems.

The research design aims to establish a suitable framework for the study. One of the most crucial choices in this process is selecting the research approach, as it dictates how relevant information for the study will be gathered. However, the research design process encompasses numerous interconnected decisions. Tomaszewski et al, Zarestky et al, and Gonzalez et al (2020: 1) cited Denzin & Lincoln (2011), who hold that qualitative research draws from interpretivist and constructivist paradigms, seeking to gain an in-depth understanding of a research subject rather than predict outcomes, as in the positivist paradigm. According to Ansari et al, Rahim et al, Bhoje et al, and Bhosale et al (2022: 1132), research designs include descriptive, exploratory, experimental, longitudinal, and cross-sectional designs, as well as causal, action research, cohort, and case study designs. In this case, Ansari et al, Rahim et al, Bhoje et al, and Bhosale et al (2022: 1133) state that descriptive and exploratory research design is a type of research project that aims to obtain information to describe an object, situation, or population systematically, it helps to answer questions about what, when, where, and how about a research problem, this method comprehend the use of different kind of research method to investigate the variables in question. This research employs a descriptive design to provide an accurate profile of the cultural, ethical, and social perspectives surrounding Artificial Womb Technology from a Zulu Indigenous standpoint. The main reason for employing a descriptive and exploratory design is that it enables the study to develop a comprehensive understanding of the phenomenon under investigation, capturing insights from cultural, ethical, and social perspectives.

3.3 Research Approach

3.3.1 Qualitative Method

According to Djafar (2021: 341), between 1950 and 1970, a second-stage experience emerged, characterised by a modern approach to qualitative research. The data analysis was controlled

by various methods of coding material, which can be retrieved from participant observation (Djafar, 2021: 341). Busetto et al, Wick et al, and Gumbinger et al (2020: 1) defined qualitative research as the study of the nature of phenomena, including their quality, different manifestations, the context in which they appear, and the perspectives from which they can be perceived, excluding their range, frequency, and place in an objectively determined chain of cause and effect. According to Oranga & Matere (2023: 2), qualitative methods are effective in obtaining information about behaviour, opinions, and social contexts of a particular population. Qualitative methods are effective for identifying intangible factors, including socio-economic status, social norms, gender roles, ethnicity, and religion, whose roles in the research may not be readily apparent. Lim (2025: 201) cited Hammarberg et al, Kirkman et al, & de Lacey et al (2016), who assert that qualitative methods are used to answer questions about experience, meaning, and perspective, most often from the participant's standpoint. Qualitative data serves as the foundation for navigating quantitative data analysis, encompassing observations, recordkeeping, and interviews that support the findings and data (Djafar, 2021: 339). According to Mwita (2022: 621), qualitative research methodologies include small-group discussions to investigate beliefs, attitudes, and normative behaviours; semi-structured interviews to explore perspectives on particular issues or to gather insights from key informants regarding institutional settings; thorough interviews to obtain personal insights into conditions, experiences, or events; and textual and written analyses, such as government reports, media articles, websites, or diaries, to reveal shared or confidential knowledge. Qualitative research encompasses case studies, surveys, and historical and document analysis (Hamilton, 2019: 113). It is a broad term used to refer to theoretical perspectives, designs such as historical research, theory, and content analysis (Djafar, 2021: 342).

According to Karimzadeh et al, Saedi et al, and Amini Farsani et al (2025:76) the methodological process boosts confidence in the trustworthiness of the qualitative data, leading to more reliable inferences of the findings. Qualitative content analysis has become one of the most commonly utilised methods of analysis in planning research (Esmaeli et al, Sheydayi et al, & Jamalabadi et al, 2025: 1). This study assesses secondary data from books, papers, and journal articles that address bioethics, reproductive technology, and indigenous African values within this framework. As a result, the qualitative design facilitates the conceptual integration of various perspectives and concepts, allowing the study to be insightfully based on both contemporary bioethical theory and African moral philosophy. This study employs a qualitative method to explore the ethico-cultural implications of artificial womb technology from a Zulu

Indigenous perspective, allowing for concerns and interpretations on how this technological innovation aligns with, or conflicts with, their cultural beliefs and values, thereby guiding a more contextually sensitive and culturally informed approach.

3.3.2 Current Study's Research Approach- Desktop Research

Desktop research is a systematic investigation and analysis of existing information and data, primarily conducted through online sources (Banasick, 2019:1). It entails gathering, synthesising, and interpreting secondary resources to generate insights and understanding on a specific topic or research question (Hamilton, 2019: 125). In this research, desktop research serves various purposes; it helps researchers gain an initial understanding of a subject or phenomenon before embarking on primary research. This method is crucial in identifying and analyzing existing research, theories, and concepts related to a specific topic (Banasick, 2019:1). Desktop research aids in the formulation of testable and researchable hypotheses by examining previous research findings (Hamilton, 2019: 126). This study focuses on using existing data and case studies to evaluate and analyses the ethico-cultural implications of Artificial Womb Technology within the Zulu Indigenous context.

Mwita (2022: 619) asserts that to draw relevant conclusions, qualitative research often employs a range of data collection methods. These methods include interviews, focus group discussions, observations, open-ended questionnaires, and documentary reviews. The data collection method is a procedure for collecting information from various sources using different techniques (Heap, 2019: 150). Tools, such as the analysis of existing data sources, form part of the data collection method (Mwita, 2022:532). According to Mwita (2022:620), qualitative research may seek relevant information from newspapers, organisational reports, books of accounts, and other applicable written sources. Ahmad and Wilkins (2024:12) explain the importance of synchronising data collection and analysis to ensure that the applied data collection method is suitable, the collected data begins to yield answers, and to determine whether the data analysis strategy is appropriate or needs to be adjusted to maximise the use of the collected data. The primary objective of the data collection method in this research is to gather accurate information that supports informed decision-making. The research gathered data by analysing existing data sources, critically evaluating the relevance of secondary data. This study reviewed various academic journals, papers, and reports to gather information about the research topic and the research problem.

3.4 Describe-Evaluate-Consult-and-Act (DECA) Method

The DECA method is a modified version of the See-Judge-Act framework for moral decisionmaking, designed to help students integrate ethical theories into real-world business challenges while also engaging in critical reflection on their prior choices and actions (Kretzschmar and Bentley, 2013: 5). This study adopts the DECA framework due to its unique integration of structured, phased deliberation with an explicit commitment to dialogical and communal epistemic practices. The DECA framework has the capacity to accommodate pluralistic viewpoints, resist premature normative closure, and foster an ethically reflective process that is as inclusive as it is decisive. This study adopted the DECA method developed by Louise Kretzschmar and Wessel Bentley:

Describe

The first step is to describe the ethical issue or dilemma at hand. Although distinctions between a general moral problem and a specific moral dilemma, as well as the nuanced meanings of ethics and morality, are not explored in depth, this approach encourages objectivity in addressing the situation. By stepping back to describe the dilemma and identify the various available options, students begin to discern the essence of the ethical challenge and may, while developing an initial sense of the most appropriate course of action (Kretzschmar, Bentley, 2013:5). This study drew on scholarly articles, indigenous knowledge systems, and cultural analysis to assess how artificial womb technology aligned with or conflicted with Zulu ethical frameworks. **Evaluate**

The second step requires evaluating the ethical problem and the potential solutions identified in the first step. This evaluation is conducted by applying three ethical frameworks, such as deontology, teleology, and virtue ethics, to the identified issue. These classical approaches to moral decision-making are employed to familiarise students with their key insights and to promote critical reflection beyond a limited pragmatic or strictly consequentialist “win-win” perspective (Kretzschmar, Bentley, 2013:5). For this research, I adapted this process by applying the core principles of the *Isintuism*, focusing on *Ubuntu*, which emphasised interconnectedness and humanity, *Isizwe*, focusing on ancestry and lineage, and *Umhlaba* looking at the sacred, as the definitive ethical lenses through which to critically assess the implications of AWT, moving the analysis beyond Western bioethical principles to a culturallygrounded Zulu perspective.

Consult

The third stage in the decision-making process involves consultation. This step is crucial, as no individual possesses complete knowledge or insight (Kretzschmar & Bentley, 2013:6). Even when a student believes they can resolve a moral dilemma independently, seeking additional perspectives is advisable. Such consultation may involve obtaining advice from a relevant authority, colleague, or peer. For individuals with specific religious or spiritual beliefs, guidance from spiritual leaders, as well as reflective practices such as prayer or meditation, may also be appropriate. Engaging in dialogue with others helps to ensure that important considerations are not overlooked and that personal biases or self-interest do not influence the outcome. Through consultation, students can verify that they have a comprehensive understanding of the situation and that their decisions are supported by others who may offer alternative viewpoints. This step emphasises the importance of collective wisdom in moral decision-making (Kretzschmar & Bentley, 2013:6). In this study, I engaged with a body of academic literature that represents Zulu indigenous knowledge systems, ancestral traditions, and the works of African ethicists, whilst integrating communal and ancestral wisdom into the ethical evaluation.

Act

After completing the consultation process, the student is encouraged to put their decision into practice. This constitutes the final stage of the decision-making process.. At this point, the learner is prepared to address the issue with confidence, aiming to act justifiably and ethically (Kretzschmar & Bentley, 2013:6). My recommendation is that the introduction of artificial womb technology into African societies, in Zulu communities, requires a careful balance between technological innovation and cultural preservation. This study aims to provide actionable recommendations in its final chapter, offering a justified and ethically-grounded framework for policymakers, bioethicists, and communities to navigate the introduction of artificial womb technology in a manner that respects and preserves Zulu indigenous values.

3.5 CONCLUSION

This chapter outlined the methodological framework that guided this study on the ethnocultural implications of Artificial Womb Technology from a Zulu Indigenous perspective. The chapter justified adopting a qualitative approach, emphasising the importance of understanding cultural meanings, perspectives, and ethical considerations rather than relying solely on quantitative measures. The descriptive and exploratory research design and desktop research enabled the

systematic collection and analysis of secondary data, including literature, case studies, and reports, thereby ensuring a comprehensive understanding of artificial womb technology within the Zulu cultural and spiritual context. Data collection and analysis were conducted to guarantee reliability and validity. The DECA (Describe-Evaluate-Consult-Act) method provided a structured approach to ethical decision-making, promoting reflection, consultation, and culturally informed action.

The selection of a qualitative method was suitable for this study, as it was effective for obtaining information on intangible factors such as socio-economic status, social norms, gender roles, ethnicity, and religion, and for answering questions about participants' experiences, meanings, and perspectives. This approach allowed the research to navigate and interpret complex cultural and ethical landscapes, which was essential when investigating how a technological innovation like AWT aligned or conflicted with Zulu beliefs and values. By employing a descriptive and exploratory research design, this study aimed to gather information systematically to describe and explore the situation, thereby helping to answer the questions of what, when, where, and how regarding the research problem, and providing an accurate profile of the cultural, ethical, and social perspectives at play. A qualitative desktop research approach was chosen to conduct a systematic investigation and analysis of existing information. This method was crucial for identifying and analysing existing research, theories, and concepts, as well as for gaining an initial knowledge and understanding of the subject. The DECA method offered a robust, step-by-step framework for navigating the ethical dimensions of this issue. The Describe stage was objectively used to outline the ethical dilemma AWT presents within the Zulu context. The Evaluate stage involved a critical assessment of the problem and potential solutions, applying relevant ethical frameworks to the identified issue. The Consult stage emphasised the importance of collective wisdom, recognising that no individual possesses complete knowledge and that seeking additional perspectives is essential for a comprehensive understanding, thereby ensuring that personal biases do not exert inappropriate influence. Finally, the Act stage prepared the ground for implementing a justified and ethical decision, aiming to address the issue with confidence.

In conclusion, methodology ensures that the study is conducted by integrating empirical evidence with ethical reflection. The chosen qualitative desktop approach, guided by a descriptive design and structured by the DECA method, provided a coherent and systematic pathway to explore the complex interplay between a groundbreaking technology and a rich indigenous worldview. This structured process is vital for ensuring that research outcomes are

both academically sound and culturally sensitive. The next chapter will present the theoretical framework that guides the analysis of the ethico-cultural dimensions of AWT, providing conceptual lenses for interpreting the findings.

CHAPTER 4

THEORETICAL FRAMEWORK: ISINTUISM

4.1 INTRODUCTION

The previous chapter reviewed the existing literature on artificial womb technology, examined its foundational concepts, and explored Indigenous and African cultural perspectives on reproductive technologies. The chapter then identified a need for a Zulu Indigenous perspective, along with cultural and spiritual context, as a gap this study seeks to address. This chapter outlines the theoretical framework that will guide this study, offering the perspective from which the ethical and cultural implications of Artificial womb technology will be evaluated from a Zulu Indigenous perspective. This study employs the theoretical framework of *Isintuism*, an Afrocentric paradigm rooted in the concept of *Ubuntu*, to guide the study process and analyse the findings. *Isintuism* underlines the interconnectedness of individuals within spiritual, social, and natural realms, prioritising African traditions and ethical ideals in

addressing challenges. This chapter aims to use *Isintuism* to explore communalism, spirituality, the preservation of cultural and traditional beliefs, and the relationships that shape Zulu perspectives on life, reproduction, and ethical responsibility. These include the respect for ancestors (*amadlozi*) as custodians of morality and intermediaries with the spiritual world, and the central role of spirituality that permeates all aspects of life. The framework further explores the interconnectedness of life (*ubudlelwane*), which posits that human identity is formed through relationships with the community, the natural world, and the ancestral realm. This leads to a deep respect for nature and its natural processes, viewing them as sacred and integral to maintaining cosmic harmony. Its communalism and collective identity define *Isintuism*. This chapter will define *Isintuism* in depth, examine *Ubuntu* as the foundation of *Isintu*, present an argument for its selection, discuss the potential limitations of the *Isintu* philosophy, and outline how its principles will guide the analysis of artificial womb technology in this study.

4.2 Definition of Isintuism

Isintuism is an Afrocentric perspective emphasising '*ubudlelwane*,' which refers to the interconnectedness of individuals between the social, spiritual, and natural realms (Makhanya, 2023:57). Van Breda (2019:440) identifies '*ubudlelwane*' as a principle of interconnectedness between human beings and divine powers, as a central pattern emerging within the broader worldview. *Isintu* employs art, taboos, and idioms to establish the principles and values that characterise acceptable human behaviour, as defined in the philosophy of *Ubuntu* (Makhanya, 2023:57). The term *Isintu* originates from Nguni languages and refers to humanity or the essence of being human. This term reflects the perspective of African Indigenous societies, such as the Zulu, who view human existence as communal and interdependent. *Isintuism* serves as a conceptual framework that emphasises African traditions, moral values, and spiritual beliefs in addressing contemporary issues. Living according to *Isintu* involves continuous adoption of beliefs, customs, and cultural traditions in daily life (Dyantyi, 2021:50). In this context, cultural values and norms and *Ubuntu* are interchangeable, as *Ubuntu* is a direct expression of *Isintu* (Dyantyi, 2021:50). Human relationships form the basis of *Isintu*, outlining communalism as an essential component of existence.

4.3 Ubuntu as the Foundation of Isintu

Makhanya (2024:10) cites Ramose (2010), who asserts that in *Ubuntu*, human beings embody dignity. *Umuntu* (a person) signifies a bearer of dignity, indicating that a person possesses a distinct value (Makhanya, 2024:10). *Ubuntu* defines the philosophy of '*Isidima*,' which is

known human dignity, moral integrity, compassion, interconnectedness, and community, emphasising and improving ethical and caring practices (Munzhedzi, 2025:1). Munzhedzi (2025:1) asserts that *Ubuntu* includes actions that are valuable to the community, starting with simple acts of service such as lending a helping hand to strangers to more intricate interactions involving others. *Ubuntu* is an African philosophy rooted in diverse groups of black Africans, such as the Khoi, Sendawe, Hadza, Masarwa, Bantu, and Kush, among others (Mavuka et al, Gandidzanwa et al, Chirisa et al & Kwenda et al, 2025:29). According to Munzhedzi (2025:2), *Ubuntu* comprises values that promote and maintain harmony among individuals, between humans and their environment, and between humanity and other beings. In *Ubuntu* tradition, cooperation among individuals, social cultures, and creation is of utmost importance. Shumbamhini and Chirongoma (2025:786) assert that the ethics of *Ubuntu*, a way of life, emphasise treating all individuals with respect, equity, and justice while adhering to tribal and ethical customs and traditions. *Ubuntu* is centered on principles of fairness and justice. Samuel (2023:91) cited Metz (2011), who holds that an action is deemed right to the degree that it fosters a collective identity among individuals based on goodwill, where an act is considered wrong to the extent that it neglects this principle and prioritises the individual over communal living. This concept elevates *Ubuntu* from an ambiguous notion of friendliness to a principle that can apply in ethical assessments. Radebe (2025:273-274), citing Ramose (2005), argues that addressing individual behaviour is crucial, as peace is built on justice; he asserts that peace without justice is the dislocation of *umuntu* from the cosmic order. According to Radebe (2025:274), ensuring that everyone lives well and in harmony is another way to ensure that people do the right thing, thereby aligning with the cosmic order. *Ubuntu* is primarily concerned with justice grounded in ethics, advocating for individuals to act in accordance with the principles of *Isintu*.

Mavuka et al, Gandidzanwa et al, Chirisa et al, and Kwenda et al (2025:29) assert that *Ubuntu*, grounded in the lived experiences of African people, facilitates its translation into Indigenous social work practices. Through the otherness of other human beings, a human being establishes their own identity. Otherness encompasses human diversity, languages, histories, values, and customs, which collectively shape human society. *Ubuntu* holds that an individual attains awareness of their existence, along with associated rights and obligations to oneself, others, and the universe, through the presence of others (Munzhedzi, 2025:2). In other words, isolated from all others, no individual personal life is possible, let alone personal consciousness, which is based not only on the living members of society, but also on all those who have died and

from whom the current members descended. Shange (2025:2) cited Bhengu, who asserts that individuals exist within a social collective and cannot thrive in isolation; even after death, they continue to inhabit the society in spirit as *abaphansi* (ancestors). The idea of ubuntu is complex and embodies the fundamental African ontology, emphasising respect for all individuals, cultures, ancestors, and the environment. *Ubuntu* establishes connections among ceremonial healing, spirituality, and ecology, as well as land, identity, and language (Shange, 2025:2). According to Munzhedzi (2025:2), the culture of *Ubuntu* acknowledges that previous generations shape the present generation, and that the experiences of an individual are interconnected with the community to which they belong.

Shumbamhini and Chirongoma (2025:786) assert that *Ubuntu* seeks to affirm and honour the dignity of each individual. It aims to develop and sustain mutual and respectful relationships founded on a deep respect for the humanity of others. Ewuoso (2019:93) cited Khoza (2006), Luhabe (2002), Mandela (2006), and Tutu (1999), who argue that *Ubuntu* embodies the ability within African culture to express compassion, reciprocity, dignity, humanity, and mutuality, aimed at fostering and sustaining communities characterised by justice and mutual care. Ewuoso and Hall (2019:94) cited Ngowi (1999), who asserts that the *Ubuntu* application is widely used across the African continent and among ethnic groups in Southern, Central, West, and East Africa; hence, it is integrated into various aspects of daily life among Bantu-origin populations. *Ubuntu* emphasises the importance of collective solidarity, which is fundamental to the long-term existence of African communities. This means that an African is not viewed as an individual, but as a member of a community. Mugumbate and Chereni (2019:28) cited Metz (2016), who asserts that children develop personhood through interactions with family members, emphasising the importance of valuing communal and harmonious relationships. Mabele et al, Krauss et al, and Kiwango et al (2022:97) cited Murove (2014), who argues that the fundamental concept of *Ubuntu* is the recognition of one's humanity through the acknowledgement of others' humanity, emphasising the importance of being a human being within a community.

Ewuoso and Hall (2019) cited Matolino and Kwindigwi (2013), who argue that the normative ideals of *Ubuntu* are based on specific metaphysical and communal conditions, including strong interpersonal interdependence, shared moral values, limited individualism, interconnectedness, and pre-modern communal life worlds. However, Matolino and Kwindigwi argue that these conditions no longer exist in South Africa's modern, fragmented, urbanised, and globalised society, thereby reducing the viability of *Ubuntu* as a moral framework in contemporary

contexts. Udah et al, Tusasiirwe et al, and Mugumbate et al (2025:4) define *Ubuntu*-aligned behaviour as a person's state of being in which their actions are guided by their capacity for reasoning and thinking within the community. Rational behaviour emphasises positive human values, such as love, sympathy, kindness, and sharing. According to Udah et al, Tusasiirwe et al, and Mugumbate et al (2025:4), respect is the objective and unbiased evaluation and regard for another person's rights, values, and beliefs.

4.4 The Principles of Isintuism

Mokoena (2025:142) defines African traditional religion as an umbrella term encompassing the cultures, cosmologies, philosophies, and spiritualities of diverse ethnic groups, emphasising its pluralistic nature and uniqueness. African traditional religion (ATR) refers to the indigenous beliefs and practices of Africans on the continent, transmitted orally and expressed through art from generation to generation (Mokoena, 2025:142). As the foundation of *Ubuntu*, *Isintu* serves as a guide for how people, communities, and groups of people live their lives (Mavuka et al, Gandidzanwa et al, Chirisa et al & Kwenda et al, 2025:29). *Isintu* philosophy is a holistic way of life in South Africa that incorporates moral behaviour, community ties, respect for ancestors, and harmony with the natural world. It serves as the ethical and spiritual basis through which individuals understand their existence in relation to others, the environment, and the spiritual world (Mokoena, 2025:142). Mavuka et al, Gandidzanwa et al, Chirisa et al, and Kwenda et al (2025:29) assert that they serve as a frame of reference to determine what is regarded as good or bad, acceptable, and unacceptable. The principles of *Isintu* encompass the role of ancestors and spirituality, the interconnectedness of life, respect for nature and natural processes, and communalism and collective identity, which guide the way of life in Zulu culture.

4.4.1 The Respect for Ancestors

Africans acknowledge a group of spiritual entities called *izinyanya*, or *amadlozi*, which translates as ancestors (Clark, 2021:48). In the past, various scholars have defined African traditional religion as ancestral worship, mainly because of the significance of belief in their existence. Goeieman (2022:17) asserts that ancestors, while serving as guardians of morality, often express emotions similar to those of the individuals living in the physical realm. Emotions such as irrationality, jealousy, and perceptions of unfairness emphasise their continued humanity (Goeieman, 2022:17). The emotions ancestors experience are connected to ancestral curses that result in natural and biological calamities, including disasters, illness, and death for individuals in the physical world. According to Claudiaus et al, Shino et al, Job et al, Hofmann

et al, and Thalmayer et al (2022:4), ancestors have a significant impact on the lives of those who follow their guidance. This suggests that the ancestors' influence extends beyond a visible metaphysical reality.

Claudiaus et al, Shino et al, Job et al, Hofmann et al, and Thalmayer et al (2022:4) claim that all deceased individuals, even after physical death, continue to exist in the memories of those who remember their presence within the community. They are considered essential members of the family in many parts of Africa. Clark (2021:48) asserts that ancestor reverence enables ancestors to exert significant influence on their descendants' behaviour and facilitates the identification of both close and distant kin. According to Dyantyi (2021:26), they are perceived as always present and invested in their families' matters; this perception leads family members to show respect and make sacrifices in pursuit of their protection, blessings, and intervention during conflicts and challenges. Ushe (2018:171) cited Mbiti (1975), who introduced the term "the living-dead" to describe the good spirits of recently deceased individuals, perceived as still connected to the living within the community. Ukwamedua (2018:30) asserts that in African religious thought, the deceased are considered to persist in existence within the invisible and metaphysical realms. Africans interpret death as a rite of passage to the ancestral world. Ancestor reverence promotes respect for ancestors, who provide the genetic and cultural foundation for their descendants, and encourages respect for all identifiable living codescendants (Clark, 2021:48). Disregarding traditions leads individuals to disregard the impact that ancestors and relatives may have on an individual's behaviour. Disrespect towards ancestors can lead to disrespect for their living descendants.

According to Ushe (2018: 171), the belief in the presence of the deceased within the community is common, with ancestors viewed as guardians and symbols of customs, traditions, and morals in African society. They serve as custodians of tradition and act as intermediaries, with the preservation of tradition essential to the continuing influence of ancestors on their descendants (Ukwamedua, 2018: 33). Ancestors are considered the protectors of a community, influencing the moral conduct of individuals, groups, and society as a whole (Goeieman, 2022:14). They are frequently regarded as equivalent to the living elders of the remaining population. This means that ancestors play a role similar to that of our living elders. Goeieman (2022:11) asserts that ancestors guide their descendants, assist in significant decision-making, and participate in crucial life events. As in the relationship between a parent and a child, ancestors often guide their descendants, influencing their choices and behaviours for the better. Clark (2019:49) states that ancestors bless and protect their family members; however, if the community or individuals

violate moral law, ancestors use punishment to remind the living of their responsibilities. They visit the community in dreams and visions, giving specific orders. The rejection of ancestral influence by one generation can result in the irreversible loss of traditions (Clark, 2021:49). Without referring to deceased ancestors, which are often symbolized by traits that identify ancestral lineages, individuals would only trace their ancestry back a few generations with the mother as the primary focus, similar to the degree of kin recognition in other primates (Lebaka, 2019:4).

To attain the status of a living-dead and an ancestor, one must have served as a role model within the community. Banda (2019:215) contends that there is no distinction between the spiritual and the physical. According to African religious beliefs, the ancestors are believed to possess a state of personal immortality. They are externalised through the physical continuation of the individual, facilitated by procreation, allowing children to inherit the characteristics of their departed parents or ancestors. Banda (2019:215) states that well-being depends on the state of harmonious relationships between individuals and the spirit world, maintaining equilibrium between the material and spiritual realms, thereby ensuring humanity's safety. In African religions, respect for ancestors is a significant component of religious practice. Lebaka (2019:6) asserts that Africans believe their ancestors will protect them and their descendants in return for the tributes offered by the living. Ramaube et al, Du Plessis et al, and Mogale et al (2022:42) assert that, among the Zulu-speaking population, the origins of diseases and misfortunes are perceived as associated with ancestral spirits in a state of anger. The Zuluspeaking community holds the belief that an ancestor characterised by an enraged temper, referred to as '*idlozi elinolaka*', and would respond with significant severity when feeling offended (Ramaube et al, Du Plessis et al, and Mogale et al, 2022:42).

4.4.2 The Respect for Spirituality

Mokoena (2024:5) asserts that African spirituality shapes *Ubuntu* ethics, influencing behaviours and activities that may be challenging for those unfamiliar with this spirituality to understand. Kobe (2021:6) argues that Africa is characterised by diverse spiritualities, some indigenous to the continent and others emerging from interactions with external cultures. The fact that there is more than one African spirituality must be emphasised, because, despite many of their traits being similar, they can be interpreted differently. Knoetze (2019:3) asserts that the spirits of ancestors engage in unrestricted interaction with the living. Authentic spirituality does not involve distancing oneself from the world; it is not an attempt to flee reality, but rather an engagement with it, as when one is afflicted with illness. Knoetze (2019:3) posits that

genuine spirituality is action-oriented, aimed at healing the world's brokenness. It blurs the lines between the sacred and the world, as well as between earthly and spiritual salvation. The expected actions from spirituality include caring for others, pursuing transcendence, and seeking goodness, truth, and forgiveness.

Magoqwana (2025:3769) asserts that *Isizwe* embodies a Nguni viewpoint on society, grounded in the concept of the "collectivity" of people (*abantu*). This concept includes the clan and lineage, creating a spiritual continuum that connects the living, the unborn, and the ancestors (*amadlozi*). Ukwemedua (2018:27) posits that ancestors are venerated for their involvement in lineage matters and are believed to exert significant influence over their descendants and siblings. Thus, they serve as an essential intermediary between the physical and spiritual realms. The concept of '*imvelaphi yakho*' is a fundamental aspect of Zulu identity, referring to an individual's place of origin and connecting them to their maternal lineage, '*isibongo*' clan name, and ancestral land (Mondlana, 2019:61). Knoetze (2019:3) asserts that African spirituality is expressed through celebration, involving the celebration of life, faith, death, and suffering. Life is influenced by a spirituality characterized by intimacy and connection. Goeieman (2022:11) emphasises that ancestors are integral to the reality of their descendants, rather than existing as divine entities that require belief. Their influence is ongoing and independent, serving as guardians in daily life (Goeieman, 2022:14). African spirituality is communal rather than individualistic; in other words, life in Africa is rooted deeply in the community. Ukwemedua (2018:27) asserts that the community is responsible for preserving and ensuring the continuity of traditions and charisms. According to the African worldview, children are raised through social interactions with their siblings and other age groups because there is no life or spirituality outside of the community. The necessity for belonging is essential, as it shapes the nature of humanity (Knoetze, 2019:3). The primary role of African religion is to connect the ancestral realm with the living, encouraging community harmony and a sense of belonging. The status and role of each community member are determined by age, gender, and seniority. According to Goeieman (2022:14), individuals do not have the right to go beyond their specific spheres of competence. Goeieman asserts that in compound societies, the spiritual order reflects the social order, indicating that it is an order of power and authority.

Ritual practices are passed down from one generation to the next, according to Ohaja & Anyim (2021:3), emphasising that individuals follow an inherited culture, as our social customs continue to reflect those of our ancestors. Rituals are therefore still an integral and important part of African life and are not extinct. According to Ramaube et al, Du Plessis et al, and Mogale

et al (2022:41), ritual ceremonies occur throughout a person's life, marking various stages, including birth, maturity, and death. Ramaube et al, Du Plessis et al, and Mogale et al (2022:42) note that in many ethnic groups in South Africa, the ritual ceremonies *imbeleko*, which introduce and welcome a newborn infant into the family and the ancestral clan, and *inkaba*, the burial of the umbilical cord, are conducted. Ritual, according to Ohaja & Anyim (2021:3), is a means of establishing a responsible relationship with the cosmos, ancestors, spirits, and divinities within the human community. African rituals are reflective practices aimed at achieving practical objectives; they serve to establish identity, inspire wisdom, access divine authority to promote empowerment, and facilitate transformation (Ohaja & Anyim, 2021:3). Mochache et al, Wanje et al, Nyagah et al, Lakhani et al, El-Busaidy et al, Temmerman et al, and Gichangi et al (2020:8) assert that rituals, traditions, and beliefs play a significant role in shaping social gender, cultural norms, and moral taboos. Zulu customs encompass a broad range of beliefs and ceremonies associated with human procreation (Gugulethu, 2025:304). According to Ramaube et al, Du Plessis et al, and Mogale et al (2022:41), there are cultural customs that involve killing an animal, such as a goat, to honour or elevate the spirits of ancestors and foster a sense of community. Following the ritual, '*isiphandla*', a band made from goatskin, is tied around the infant's wrist to introduce and link them to the ancestors.

According to Ramaube et al, Du Plessis et al, and Mogale et al (2022:42), wearing a wristband (*isiphandla*) implies that the individual is a member of the family and of the ancestors.

4.4.3 The Interconnectedness of Life

Ntshangase and Zulu (2024:8) assert that *Ubuntu* is considered the foundation of African society and communal life structures, and that it fosters '*ubudlelwane*' ties among members of the continent's culture. *Ubuntu*, which means humaneness, is an African concept. It embodies firmly held African beliefs that one's identity derives from connections to others (Van Breda, 2019: 440). Makhanya (2024:1). Before a person accomplishes or becomes anything in the world, ubuntu, or personhood, must be acknowledged as an individual with human dignity. According to Van Breda (2019:440), this pattern of connectivity among individuals manifests as a philosophy or worldview. According to Zulu philosophy, life is not a solitary possession but rather achieved through ongoing engagement with other people and the creation of things (Van Breda, 2019: 440). According to Ndunga (2025:7), the rich symbolism of new birth is a way for the Bantu peoples of Africa to demonstrate their continual introduction and absorption of life. Such initiations are phases of integration into the world at large. The community shapes the individual, enabling them to realise their full potential. Ndunga (2025:8) cited Chuwa

(2012), who claimed that life continues after death. When a person dies, he reaches the last step of initiation, and even at that point, he is accepted into the larger family of both the living and the dead (Ndunga, 2025:8). Owing to its deep respect for life, the *Ubuntu* culture honours the process of birth, and the most society members participate in this process; however, it does not conclude with physical childbirth (Ohaja and Anyim, 2021:3).

Ubuntu is the foundation of *Isintu*, where communing with others refers to more than just real living people; it also refers to the fundamental interconnectedness of all life in the natural and spiritual worlds (Ewuoso & Hall, 2019:96). According to Ewuoso and Hall (2019:96), in *Ubuntu*, the notion of 'communing with others' extends beyond mere interactions with living human beings; it encompasses an interconnectedness of all life within both the natural and spiritual realms. Thus, *Ubuntu* represents an ethical theory that integrates the natural and spiritual realms. This moral theory is based on a conceptual framework in which a person ought to perceive themselves as associated and interconnected with the spiritual world on the vertical line, as well as other non-human species and the larger environment on the horizontal line (Ewuoso and Hall, 2019:96). *Ubuntu*, then, is an ethical paradigm that unites the spiritual and natural realms. This moral theory is predicated on the idea that a person should regard themselves as connected to and interconnected with the spiritual realm, and that a person is never fully human when they are not a part of networks of kinship, community, and spirituality (Ewuoso & Hall, 2019:96). Ancestors are honoured and play a vital role as spiritual mediators in African traditional religions (Diko, 2025:3). Ancestors are viewed as a bridge between the living and the divine, having the power to affect the well-being of both people and communities, claims Diko (2025:3).

Ewuoso and Hall (2019:9) assert that the interconnectivity of life influences moral behaviour daily rather than being a theoretical stance. The notion that well-being is a shared reality is reflected in rituals such as '*ukuphahla*', which means communion with ancestors, group ceremonies, and '*indaba*', which denotes dialogue-based decision-making (Gugulethu, 2025:305). Rituals, prayers, and sacrifices are used to seek the mediation of these ancestral figures, who not only uphold the moral order but also serve as sources of blessings, protection, and direction (Diko, 2025:3). *Ubuntu*, which is founded on *Isintu*, offers potential to restructure social work by emphasizing interdependence and mutual care, providing an alternative to individualistic welfare models, according to Uda et al, Tusasiirwe et al, and Mugumbate et al (2025:435). According to Nolte and Downing (2019:11), the *Ubuntu* idea is ingrained in children from an early age in rural African villages and passed on from one generation to the

next. As people mature and form relationships, elders teach them to pass on what they have learned to others. This is the first step in caring for one another; the idea of caring is shown respectfully and humbly, with young people greeting and addressing elders and superiors (Nolte & Downing, 2019:11). The *Ubuntu* maxim "I am because you are" reflects this relational way of living, according to which one can only completely realise one's humanity by receiving acceptance and encouragement from others (Van Breda, 2019:440). The expression "it takes the entire village to raise a child" is often used among Africans, and it combines morality, spiritual growth, and ethical values; it is holistic (Ohaja and Anyim, 2021:6). In other words, in an African society, it is expected that individuals interact with one another. For this reason, an adult can correct a youngster who is misbehaving, as it helps to shape the child's morals, values, and spiritual life (Nolte & Downing, 2019: 11).

For Udah et al, Tusasiirwe et al, and Mugumbate et al (2025:3), this philosophy depicts life as an interconnected web, in which humans, the environment, and spirituality are mutually constitutive, emphasising the interdependence among people, the environment, and spirituality. According to Nolte and Downing (2019:11-12), spirituality is rooted in a person's strong personal beliefs, which motivate them and shape their relationships with others and their ancestors. The significance of *Isintu* is underscored by the Ubuntu concept of spirituality, which embodies the connection between individuals and their ancestors. According to Nolte and Downing (2019:10), the Ubuntu notion, linked to the idea of ancestorship, shapes a way of life that respects people, life, elders, and the villages or communities. At this point, a person may respectfully coexist with others. They are spiritual and divine creatures who coexist with other people rather than being physical beings. One is forced to adopt African ideals as a way of life through this type of process.

According to the authors, *Ubuntu* has roots in a variety of African languages, all of which emphasise a common humanity that unites people, families, clans, and the natural world (Udah et al, Tusasiirwe et al, Mugumbate et al, 2025:4). Since clans tend to particular animals or plants, *Ubuntu* views a symbol system, collective rituals, and proverbs as tangible manifestations of this interdependence, emphasising the idea that humans need to preserve the natural world (Udah et al, Tusasiirwe et al, Mugumbate et al, 2025:4). The *Imbeleko* and *inkaba* ceremony, which honours the natural completion of birth by burying a newborn baby's umbilical cord and afterbirth on ancestral grounds as a way to introduce the child to the ancestors, is one of the postpartum rituals that hold great significance for *Isintu* (Matholeni, 2019:430). In practice, relationality functions across three levels: kinship ties, community

connections, and societal relationships, thereby situating each action within a broader relational network (Udah et al, Tusasiirwe et al, Mugumbate et al, 2025:6). *Ubuntu* challenges any sense of solitary existence by demanding that all things live in relatedness, establishing social wellbeing, environmental stewardship, and spiritual connectivity as inseparable aspects of life (Chigangaidze, 2025:20). Hence, the interconnection of life in *Ubuntu* is a fundamental idea that guides social work practice, ethics, and daily living, encouraging people to see themselves as a component of a deeper, interdependent ecosystem.

4.4.4 Respect for Nature and Natural Processes of Life

Moyo (2021:125) asserts that *Isintu* represents a way of life grounded in African Traditional Religion (ATR), encompassing various norms and rituals concerning rites of passage intended to preserve life and relationships among individuals, families, and the community, as well as interactions between the living and the living dead. Within the Ndebele worldview, death signifies not the end of life but rather its perpetuation within the realm of the ancestors. Cakata (2023:50) defines *Isintu* as a culture rooted in the notion of *Ubuntu*, elaborating on this in the subsequent section, which stresses the interconnectedness of individuals with their surrounding world. Moyo (2021:125) asserts that *Isintu* evolves through human relationships; as the connections weaken, *Isintu* also declines. *Isintuism* underpins communalism among the Nguni, encompassing several rituals, observances, and behavioural patterns that may be classified as customs, traditions, culture, or religion by scholars in anthropology, sociology, and the philosophy of religion (Moyo, 2021:125).

Mkhize (2018:28) cited Mbatha (2009), who contends that nature, referred to as '*Imvelo*' in African communities, embodies the natural processes and cycles of life. In *Isintu*, reverence for nature and the inherent processes of life constitute a fundamental ethical value that directs humanity's interaction with the environment and the cycles of existence. Nche and Michael (2025:4) assert that the essence of existence, reality, and being encompasses the foundational beliefs and metaphysical interpretations about the nature of reality. Makhanya (2023:57) asserts in *Isintu* that human beings are not distinct from the natural world and are deeply intertwined with all life forms, both visible and unseen. This perspective acknowledges land, water, air, animals, and plants as sacred components essential to sustaining life, requiring their care and accountability (Nche and Michael, 2025:5). Shange (2025:1) states that Ecology significantly influences social and spiritual aspects within various African cultural groups. This is evident in African ontological perspectives on the self, such as ubuntu philosophy, in which ecology is seen as an extension of the self. Hence, the various interactions and rituals conducted in nature

are perceived as a means of pursuing completeness in one's identity. According to Shange (2025:1), the connection between the self and nature is significant for groups such as the Zulu, as it promotes environmental conservation and is vital for both the individual and the community. Individuals frequently turn to nature, guided by rituals, to rejuvenate the self when faced with health issues, modern life challenges, and the violent legacy of colonialism and neocolonialism that aim to obliterate the African identity. The community has a moral obligation to cultivate and influence the person, guided by ubuntu principles that foster respect, love, and compassion. This principle is distinctly manifested in human life, as *Isintu* significantly influences natural processes, which include pregnancy and childbirth, which are regarded as sacred. Indigenous practices during these stages are founded on ancestral wisdom, with knowledge being transmitted from elders to the young generation (Shange, 2025:1). The perception of harmonious coexistence underpins why traditional Africans tend to exercise greater caution in their interactions with non-living things and the various unseen forces of the world (Nanthambwe, 2025:3).

The natural processes of birth, growth, maturity, death, and rebirth go beyond biological events; they are divine rhythms of existence. In *Isintu* philosophy, these processes are regulated by *umoya*, signifying spirit, and '*amadlozi*', meaning ancestors, which contribute to the preservation of harmony between the physical and spiritual worlds (Makhanya, 2023:57). According to Ndlovu and Ngema (2022:18), this transmission system guarantees that community activities continue to uphold respect for natural processes. This suggests that ancestral veneration in the spiritual realm underscores their active involvement in familial affairs, preserving traditions and sanctioning those who transgress against them. Nche and Michael (2025:6) argue that the natural perspective of traditional African religion is rooted in reverence and a perception of ancestral spirits, rather than in veneration for nature itself. Ndlovu and Ngema (2022:18) assert that traditions prioritise collaboration with natural processes rather than opposition to them. Honouring these processes entails recognising that life progresses in phases, each filled with significance, dignity, and insights for the community. Rites of passage, including initiation, marriage, and burial ceremonies, are not mere cultural traditions but ethical activities that respect the natural progression of human existence within the larger cycles of creation.

Isintu asserts that the exploitation of nature undermines both the environment and the ethical foundation of civilisation (Nche and Michael, 2025:13). Nature is perceived not as a resource to be exploited, but as a living system with which to coexist. Disregarding nature is

disrespecting the ancestors, as they are said to inhabit the land and natural elements (Ephirim-Donkor, 2021:27). These activities demonstrate the recognition that individuals inhabit distinct cultural and ecological environments, which shape their knowledge systems, including reproductive social and cultural practices (Dlamini, 2025:1972). Nche and Michael (2025:13) assert that this perception of interdependence and interconnection calls for noninstrumental appreciation for nature and non-human entities, taking into account their value to humanity. The ethical behaviour in *Isintu* demands sustainable practices, ethical care, and respect for the land, as well as an acknowledgement of humanity's reliance on the natural order. Indigenous customs following conception entail immediate protective actions; upon confirming pregnancy, specific obligatory remedies, including Joko tea, are prepared to safeguard against spirits that are evil and witchcraft (Masilo, 2022:91). Makhanya (2023:57) assert that it is essential to uphold a harmonious relationship and respect for *Isintu*, nature, and the natural processes of life; this viewpoint emphasises the necessity for the preservation of nature and adherence to a natural way of life.

4.4.5 Communalism and Collective Identity

African societies prioritise a community over the individual; while emphasising individual differences is discouraged to prevent pitting one person against another and preventing competition among individuals (Ewuoso & Hall, 2019:98). In African societies an individual is perceived as integral to a community and, to some extent, inseparable from it, a notion expressed in the fundamental value of ubuntu (Ewuoso & Hall, 2019:98). This concept, grounded in communalism and human interconnection, stresses interdependence and shared humanity among individuals within a community (Fagunwa, 2019:50). It advocates principles such as empathy, compassion, respect, and communal peace, which have significant effects on social connections, community development, and government processes (Fagunwa, 2019:50). *Ubuntu* promotes belonging and solidarity, integrating mutual care and sharing, which are essential for cultivating strong communities, promoting social harmony, and encouraging a feeling of collective responsibility.

This perspective significantly impacts the notion of personhood. Many reflections on ubuntu argue that personhood and humanity are defined by morals, whereby an individual is deemed more or less of a person or human by expressing moral characteristics unique to humans, and, by means of interdependent relationships (Dyantyi, 2021:50). Humanness is cultivated through social ties; personhood or humanness is not attained in isolation (Dyantyi, 2021:50). Personhood must be achieved rather than being given at human birth; thus, the mere existence

of a biological organism is insufficient. It is essential to recognize that this organism undergoes an extensive process of social and various ritual transformation to become a complete human being with qualities deemed ethical and cultural (Ewuoso & Hall, 2019:98). The community, where the physical and spiritual realms are spiritually connected, necessitates participation, compelling individuals to adopt principles and norms that guide the people (Ewuoso & Hall, 2019:98). Traditional and cultural beliefs, such as those of one's homeland and a metaphysical connection that permeates the universe, impact both individual and collective identities, aiding in the search for meaning and defining one's identity, values, origins, and life purpose (Fagunwa, 2019:50).

Fagunwa (2019:50) asserts that in *Ubuntu*, the strength of a community derives from mutual assistance and that fulfillment and accomplishment are attainable through communal living, self-sacrifice, kindness, giving back, and dedication to the community. The connection between an individual and the community under *Ubuntu* is characterised by interdependence and mutual support (Cakata, 2023: 50). To be human, therefore, means recognising humanity by acknowledging the humanity of others within the framework of *Ubuntu*. Chigangaidze and Chikanya (2020:20) stated that *Ubuntu* serves as the foundation of African communality, reflecting our interconnection, shared humanity, and the inherent obligation we have towards one another stemming from a connection. Cakata (2023:50) claims that *Ubuntu* embodies equilibrium and interconnectedness. *Ubuntu* can be characterised as a comprehensive ethic that shapes and directs the conduct of individuals within a society, extending beyond specific behaviours to promote a peaceful existence in a communal context. Fagunwa (2019:5) cited Van Binsbergen, who asserted that *Ubuntu* acknowledges four fundamental traits of humanity: human dignity and equality, shared brotherhood, the sanctity of life, and existence as the most esteemed condition.

This communal principle influences reproduction and child-rearing. Fertility is acknowledged as a spiritual occurrence that necessitates intervention techniques from supernatural forces, in addition to being a biological one (Vargas, 2025:1). This perspective situates pregnancy within a comprehensive view, wherein the invisible spirit of a child possesses a sacred essence, necessitating communal and ancestral acknowledgment (Vargas, 2025:1). The *Ubuntu* idea that "it takes a village to raise a child" applies to pregnancy and birth. A child belongs to the whole community, not just the immediate family (Tshivhase & Moyo, 2025:7). Throughout gestation and delivery, this manifests in collective customs wherein the community as a whole or extended family actively participates in the birthing process (Mulkey, 2024: 51). Traditional

beliefs recognize that infertility is perceived as both a biological issue and a spiritual matter, wherein ancestral blessings or interventions are believed to be withheld if appropriate relationships with natural and spiritual forces are neglected and not honored (Diko, 2025:3).

4.5 Arguments for the Theory of Isintuism

Isintuism offers a realistic, critical perspective rooted in the cultural and spiritual ontology it presents. *Isintuism* is fundamental, arising from a holistic lifestyle that encompasses ethical behaviour, communal bonds, veneration of ancestors, and harmony with nature, characteristic of the Zulu and Nguni perspective (Mokoena, 2025:142). It serves as the core of *Ubuntu*, directing individuals and communities in discerning what constitutes "good or bad, acceptable, and unacceptable" (Mavuka et al, Gandidzanwa et al, Chirisa et al & Kwenda et al, 2025:29). By using *Isintuism* as a framework, the study focuses on African philosophical traditions and moral principles on purpose, ensuring that the examination is culturally relevant and essential. In the African context, bioethics is closely tied to the communal and spiritual dimensions of life. In African societies, the central focus of moral consideration shifts from the individual to the community, encompassing not only the living but also the ancestors and the unborn. The primary ethical question shifts from what the individual desires to what action will promote harmony and vitality within the community as a whole. This reorientation carries significant implications for the assessment of AWT, including potential cultural and spiritual damage to the communal fabric, such as disruptions to lineage and alienation from ancestors. The emphasis on an internal frame of reference is crucial for a decolonial scholarship that seeks to validate and apply Indigenous knowledge systems in contemporary discussions. There are various reasons for implementing *Isintu* in bioethics and technological innovation. These arguments are based on its fundamental principles, which address the substantial cultural, spiritual, and communal impacts associated with moving the gestation process from a mother's body to an artificial environment.

Isintuism emphasises the ethical and cultural principles that govern the lifestyle of the African Zulu community, examining the significance of ancestors and spirituality in their lives, and acknowledging the sanctity of ancestors as life-givers. They are seen as the guardians and representations of customs, traditions, and morality, and as the primary sources or paths to a successful life, good health, children, and prosperity (Ushe, 2018:171). This conviction is manifested through ceremonies that signify each vital life step. The '*imbeleko*' ceremony, conducted to welcome a newborn, involves the slaughter of an animal and the placement of an

'*isiphandla*' (a goatskin bracelet) on the infant, a significant act of introducing and connecting them to the ancestors (Ramaube et al, Du Plessis et al, and Mogale et al, 2022:42). Ancestors are thought to be present from conception. Their blessing is perceived as essential to a successful pregnancy and the child's well-being (Ohaja & Anyim, 2021:3). The principle of *Isintu* offers several deep spiritual and ancestral questions that can be expressed through the concept of *Isintuism*.

The comprehensive nature of the framework provides a fundamental basis for its adoption, as it unifies the spiritual, communal, and natural aspects of life that are often addressed in isolation across various paradigms. *Isintuism* does not segregate human existence. It offers a cosmology in which the physical, spiritual, and social domains are deeply interconnected. This is evidenced by the significant role that ancestors (*amadlozi*) play in the family, who are considered integral members of the community, guardians, and symbols of customs, traditions, and values (Ushe, 2018:171). Their impact transcends all aspects of existence, encompassing moral direction and the achievement of significant life events such as giving birth, which is perceived as a biological occurrence and a sacred process (Mkhize, 2018:28). The *Ubuntu* principle, which is defined as a pattern of interconnectedness between people and the larger environment, further explains this interconnectedness (Van Breda, 2019:440). *Isintu* theory addresses ethical, cultural, spiritual, and community dimensions that are significant to this study, examining variables that influence the human life path in an interconnected manner.

The strong communitarian morality in *Isintuism* contradicts the individualistic paradigms that predominate in Western thought. The theory asserts that personhood is not an inherent trait, but a status attained through relationships. According to Ewuoso and Hall (2019:98), becoming a person involves accepting a set of norms created by a community of people within a society. This is embodied in the expression "I am because we are," which emphasises collective humanity and mutual responsibility. The community serves as the center of identity and moral growth, reflected in the saying, "It takes a whole village to raise a child" (Ohaja & Anyim, 2021:6). This communal identity signifies that significant life events are shared experiences. The individual's welfare is connected to the collective's harmony. Thus, *Isintuism* establishes the theoretical basis for advocating the ethical value of communal well-being, social accountability, and interdependence over individualism.

The basis of ancestral veneration and spirituality in *Isintuism* provides an important metaphysical dimension crucial to understanding the Zulu perspective on life, continuity, and

ethical order. As guardians of our morality and intermediaries, the ancestors are not forgotten forebears, and they are actively involved in the life of the living (Goeieman, 2022:17; Ukwamedua, 2018:33). Life is perceived as a gift rooted in spirituality, and significant transitions are celebrated through ceremonies that recognise this ancestral relationship. Ceremonies like *Imbeleko*, which present a newborn to the ancestors (Ramaube et al, Du Plessis et al, and Mogale et al, 2022:42), and the customs related to pregnancy, governed by specific taboos (Masilo, 2022:3), reflect a perspective in which the spiritual and physical realms are interconnected. According to Knoetze (2019:3), the spirits of the ancestors are known to interact with the living. Therefore, any theoretical framework that disregards this spiritual and ancestral dimension is lacking in understanding and interacting with this society.

By emphasising reverence for the natural world and its processes (*Imvelo*), *Isintuism* establishes a crucial ethical concept of sustainability, balance, and harmony. This perspective acknowledges humanity's deep connection to the natural environment, viewing it not as a resource to be exploited but as a sacred system to be revered. Makhanya (2023:57) observes that in *Isintu*, human beings are not distinct from the natural world, and natural processes such as birth, growth, and death are regarded as a sacred cycle of life. This regard is implemented through methods that align with natural processes, such as traditional birthing positions informed by a woman's instincts (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022:2). As a result, the idea carries an intrinsic ethical injunction against behaviours that exploit or disrupt the natural order. This suggests that harmony with nature is an essential component of a moral life. As a framework, *Isintu* is descriptive, providing a frame of context for ethical behaviour (Mavuka et al, Gandidzanwa et al, Chirisa et al & Kwenda et al, 2025:29). The communal ethics and spiritual roots promote values including empathy, compassion, respect, and communal harmony (Fagunwa, 2019:50). By emphasizing the interdependence of all life, it contests the concept of solitary existence and asserts that communal well-being, environmental stewardship, and spiritual connectedness are fundamental aspects of life (Chigangaidze, 2025:20). Making it a practical framework for assessing the ethical aspects of any intervention because it requires taking into account the effects on the environment, the collective, and the spiritual-cultural continuation. Based on Ubuntu, this chapter has developed *Isintuism* as a strong, Afrocentric theoretical framework characterised by its fundamental ideas of communalism, connection, ancestral spirituality, and reverence for the natural world. It has been framed as a set of cultural beliefs and a substantial bioethical framework with distinct moral standards.

4.6 Argument Against the *Isintu* Theory

Isintu within *Ubuntu* provides insight into African culture. Magezi and Khlopa (2021:16) contend that *Ubuntu* fails to provide practical guidance to the afflictions besetting Africa; it does not offer solutions to the continent's challenges. Banda (2019:207) asserts that although ubuntu embodies personhood or humanity, highlighting the significance of ethical coexistence with others, it presents substantial obstacles due to its masculine and patriarchal inclinations, leading to exclusivity and discrimination within the ubuntu framework. Simba (2021:63) raises a similar critique, asserting that ubuntu functions as a double-edged sword, empowering individuals through its advocacy of equality and human dignity, and, on the other hand, perpetuating oppression by encouraging masculine authority and patriarchal norms. Banda (2019:207) maintains that the constrained perspective of human flourishing is evidenced by the reality that, while promoting ubuntu, various African communities prioritise the financial advancement of boys over that of girls. Human development is conceptualised in masculine terms in many *Ubuntu*-professing communities. For instance, it is typical to hear the Ndebele praise a successful woman as *yindoda ngokwakhe*, meaning she is a man in her own right, or '*yindoda mfazi*,' meaning she is a man-woman who embodies both masculine and feminine qualities (Banda, 2019:207). With this, the author indicates that even within contemporary *Ubuntu*-practicing communities, the stereotypes of the ideal woman and the perfect child persist, emphasising subservience rather than fulfilment in their human pursuits. According to Magezi and Khlopa (2021:17), *Ubuntu* was formerly considered to have societal value; however, given current circumstances, this notion is no longer applicable. Critics contend that it is patriarchal and conservative, and its value has diminished due to its ambiguity.

Banda (2019:207) asserts that the constrained perspective of human flourishing in ubuntu is further emphasised by a discriminating and exclusive conception of human identity that defines ideal personhood. Banda (2019:207) cited Mageza (2017), who asserts that *Ubuntu* often marginalises individuals who do not have the exact geographical origin, ethnicity, or familial ties. Diouf et al. (2023:3) support this perspective, noting that connections to *Ubuntu* within traditional cultural beliefs frequently fail to protect women and vulnerable groups from marginalisation. According to Simba (2021:63), this has proven that ubuntu, beyond the performative dimensions of care, dignity, and honesty, as well as its philosophical components, relates to an experience, a culturally rooted interaction in which power dynamics are negotiated and rooted in *Isintu*. Utilising *Ubuntu* discourse as a representation of unity or reconciliation may neglect to address systemic inequality or gendered injustice due to the ambiguous

boundaries of the framework (Diouf et al., 2023:2). According to Duvenage (2020:691), appeals to community and consensus might obscure the predominance of masculine authority, thereby marginalising critical voices that challenge existing hierarchical structures. Evans and Kingsbury (2023:658) cited Hikuroa (2011), who asserts that scientific criteria cannot recognise Indigenous knowledge and that science cannot be adequately assessed using the beliefs of African indigenous knowledge. The framework is identified as complex, with internal conflicts and external criticisms regarding its ability to interact with technological innovations.

Banda (2019:215) examines the extent to which well-being depends on harmonious relationships between individuals and the spirit world, thereby establishing equilibrium between the material and spiritual realms, ensuring well-being for humanity. Banda continues to believe that safety and human well-being are dependent on harmonious connections with the good spiritual powers, and on being careful not to provoke good spirits to avoid their wrath, or to provoke evil spirits to prevent their anger. Hence, any disruption of the balance between humans and spiritual forces leads to a decline in well-being (Banda, 2019: 216). Mogezi and Khlopa (2021:17) cited Matolino and Kwindwingi (2013), who contend that the concept is outdated and incapable of influencing contemporary ethics in South Africa, as it fails to address the current social and ethical issues, despite the intrinsic value of the Ubuntu ideal. Mogezi and Khlopa (2021:17) contend that *Ubuntu* does not afford equal treatment to all individuals, as it is a cultural framework that subordinates women in the governance of customary marriage, land access, and inheritance rights.

Banda (2019:216) asserts that experiences such as childbirth, pregnancy, and illness may erode one's humanity and reduce an individual to an object. According to Adeola and Kimbu (2024:112), the loss of *Ubuntu* has tarnished the core values of most nations worldwide, as well as those of several contemporary African political systems. Jecker et al, Atuire et al, and Kenworthy et al (2022:256) assert that *Ubuntu's* emphasis on solidarity and sufficiency conflicts with the procedural reasoning of global bioethics, which promotes scientific evidence, individual consent, and outcomes that can be measured. Lemlemu (2024:33-34) asserts that urbanisation and political instability have undermined community traditions across various African nations, resulting in a disconnect between the ideal of *Ubuntu* and the lived experiences of divided communities. Adeola and Kimbu (2024:112) present a significant critique of the gendered aspects of *Isintu*, grounded in the concept of *Ubuntu*, asserting that the gender equity embodied in the *Ubuntu* philosophy is ambiguous, as gender research emphasises its patriarchal values. This finding suggests that *Isintu* promotes values of care, community, and peace;

however, it does so through gender stereotypes that emphasise women as primary caregivers and moral pillars of society.

4.7 How the Theory of *Isintu* Will Guide the Study

The study will be guided by the theoretical framework of *Isintuism*, a traditional Zulu worldview grounded in the principle of *Ubuntu*. The choice of this framework is based on its ability to offer a culturally grounded and ethically nuanced perspective for assessing the significant implications of Artificial Womb Technology (AWT). The core idea of *Isintu*, which embodies the traditions, morals, and values of Zulu culture, is the interdependence of existence, placing the individual in a network of relationships that include the living community (*abantu*), the ancestors (*amadlozi*), the unborn, and the natural world (*umhlaba*). Hence, *Isintu* is an evaluative lens that provides a standard for behaviour based on reverence for ancestral and natural orders, harmony among communities, and spiritual continuity. *Isintu* will guide the comprehensive evaluation by focusing the analysis on three fundamental, interconnected principles originating from *Isintu* and *Ubuntu*: the collective nature of personhood (*Umntu*), the reverence of lineage and ancestry (*Isizwe*), and the sacred bond with the ecological and spiritual environment (*Umhlaba*).

With *Isintu*, the study plans evaluate the ethical and cultural implications of artificial womb technology on *Ubuntu*, for humanity, and the community. In this study, the externalisation of gestation from the human body will be examined to investigate how it undermines the fundamental principles of personhood (*umuntu*), which, in the *Isintu* culture, is a status attained through social integration, communal recognition, and ancestral sanctification, rather than a biological attribute. The framework will be employed to assess whether a child gestated in a mechanical environment can be accepted into the collective moral order, or whether the technology causes moral isolation that diminishes the child's 'isidima' (dignity) and the mother's esteemed position as a life-giver. Furthermore, the study will evaluate the notion of *Ubudlelwane* (interactions) to examine how artificial womb technology disrupts the sacred, physical bond between mother and child. This bond serves as the foundation for all subsequent communal relationships and spiritual connections.

The framework will provide a comprehensive examination of the ramifications for *Isizwe*, lineage, ancestry, and the continuation of lineage. Using *Isintu*, this study seeks to examine how artificial womb technology disrupts the spiritual thread that binds the living, the ancestors, and the unborn. The framework will be used to illustrate how the technology interferes with

essential procreative practices (*Amasiko Okuzala*), such as ‘*imbeleko*’, which involves introducing the newborn to the ancestors, and ‘*inkaba*’, the burial of the umbilical cord. These practices are more than cultural customs; they are necessary actions that solidify a person's ancestry and ancestral land. The framework asserts that life is a gift from the ancestors (*amadlozi*); hence, the analysis will rigorously evaluate the spiritual validity of a child conceived without ancestral guidance and the blessing associated with natural pregnancy. *Isintu* will question whether a child conceived through artificial womb technology will be recognised by their ancestors, and by the community.

To guide the study, *Isintu* seeks to promote respect for nature and the natural processes of life; hence, it will evaluate the implications for *Umhlaba*, exploring the significance of nature, the natural processes of life, and the sacred. Using *Isintu*, the investigation will examine how technology commodifies the sacredness of the womb (*isibeletho*), converting a spiritually significant process into a commercial and industrial activity. *Isintu* will guide this study through the systematic application of its framework, *Ubuntu*, *Isizwe*, *Umhlaba*, to provide an integrated and broad critical analysis that argues that the ethical and cultural challenges raised by artificial womb technology are crucial concerns that penetrate the root of Zulu indigenous identity, spirituality, and the interconnected moral universe outlined in *Isintu*.

4.8 CONCLUSION

This chapter outlines the theoretical framework of *Isintuism* that underpins the ethical and cultural evaluation of the study. The *Isintuism* framework, grounded in Ubuntu philosophy, serves as a lens for examining the interplay between technology, morality, spirituality, and communal life. *Isintuism* acknowledges that human existence is interconnected with the spiritual, natural, and social dimensions of life. *Isintu* contends that an individual's identity and moral value are influenced by their connections with others and their ancestors. This understanding provides a critical framework for evaluating the alignment or conflict between emerging technologies, such as artificial wombs, and Indigenous African values regarding personhood, reproduction, and ethical responsibility. *Isintuism* emphasises that life constitutes a sacred continuum linking the living, the deceased, and the yet-to-be-born through ancestral and communal ties. In this perspective, birth and reproduction transcend mere biological functions, representing spiritual occurrences that promote belonging, continuity, and moral equilibrium within the community. The Zulu concept of *Isintu* emphasises the importance of rituals, customs, and taboos in preserving the sacredness of life and promoting harmony between the physical and spiritual worlds. Practices such as *imbeleko*, *inkaba*, and other

ancestral rites reflect the belief that individuals are part of a broader lineage, with the act of giving life holding both communal and spiritual significance.

The philosophy of *Ubuntu*, serving as the moral foundation of *Isintuism*, enhances this discussion through emphasising and encouraging kindness, respect, interdependence, and communal responsibility. The principle of *umuntu ngumuntu ngabantu*, which holds that a person is a person through the actions of others, underlies the definition of the human person in *Ubuntu*. From an Isintuist perspective informed by Ubuntu, ethical considerations should focus on the welfare of the community rather than on the preferences or abilities of the individual. This chapter emphasised the significance of ancestors and spirituality as essential components of African moral reasoning. Ancestors serve as moral intermediaries, maintaining alignment with divine and communal order. Given that ancestors continue to be involved in human affairs, it can be inferred that the process of making ethical decisions encompasses not only those currently alive but also those yet to be born. *Isintuism* underscores the importance of respecting nature and its inherent functions while acknowledging the sacredness of all living beings. In this perspective, the natural order functions not as a context for human actions but as a dynamic system that upholds spiritual and ethical equilibrium. This chapter establishes the interpretive basis for the subsequent analysis chapter. The following chapter will analyse how artificial womb technology intersects with Zulu Indigenous values, focusing on the ethical and cultural implications and tensions that emerge when contemporary biotechnological advancements engage with traditional African moral frameworks. The study aims to contribute to an inclusive bioethical discourse that considers Indigenous perspectives while addressing modern global challenges in artificial reproductive technologies.

CHAPTER 5

THE IMPLICATIONS OF AWT ON ZULU CULTURAL AND SPIRITUAL LIFE USING ISINTU.

5.1 INTRODUCTION

The previous chapter presented the theoretical framework that will guide the study, providing the lens through which the ethical and cultural implications of artificial womb technology will be examined from a Zulu Indigenous perspective, which is *Isintu*, rooted in the philosophy of Ubuntu and Zulu Indigenous cultures. The previous chapter presented *Isintu*, which emphasises the interconnectedness among the living, the ancestors, and the unborn within a community. It examined the reasons for this theory, the critique of *Isintu*, and how *Isintu* will guide this study. This chapter will evaluate the ethico-cultural implications of artificial womb technology from a Zulu Indigenous perspective using the theoretical framework *Isintu*, rooted in Zulu Indigenous cultures and ubuntu. In this chapter, we examine how artificial womb technology aligns with or challenges the traditions, humanity, dignity, motherhood, interconnectedness, ancestors, nature, values, and cultures embedded in Zulu indigenous thought.

This chapter aims to provide an in-depth understanding of the potential implications of artificial wombs, emphasising their ethical and cultural repercussions in Africa by placing this study within the framework of *Isintu*, founded on *Ubuntu* and Zulu Indigenous cultures. Although artificial womb technology has not been adopted in African societies, its potential implications continue to raise ethical and cultural reflection. This study examines the possible impact on traditional understandings of procreation. It seeks to identify a balanced approach that preserves *Isintu* culture and traditions while embracing the opportunities presented by artificial womb

technology. Artificial womb technology is an ectogenesis that replicates the physiological processes of the human womb to support and sustain gestation ex utero. This chapter argues that while artificial womb technology presents opportunities, such as offering possibilities to save and give life, the technology challenges the Zulu Indigenous perspective on reproduction, pregnancy, and childbirth, disrupting embodied motherhood, kinship rituals, and ancestral relations significant to *Isintu*.

5.2 Evaluating the Implications of AWT on Zulu Cultural and Spiritual Life

In *Isintu* culture, conception and childbirth are considered sacred processes governed by ethical harmony and ancestral guidance, rather than just biological events (Gwacham & Thomas, 2022:483). Thus, the development of artificial womb technology raises important moral and cultural questions. This technological innovation externalises gestation and removes and transfers the development of life from the natural womb to a mechanical setting. The artificial womb disrupts the sacred role of women as bearers of life and mediators between the ancestral and physical worlds, as well as the Zulu belief that existence is a spiritually guided and controlled continuum. A culturally grounded analysis of how artificial womb technology intersects with spiritual beliefs, moral obligations, communal identity, and the natural order that guides Zulu cultures and traditions is made possible through the lens of *Isintu*. This section will undertake a critical analysis of artificial womb technology, using the principles of *Isintu* to outline its implications for *Ubuntu*, redefining personhood, communal relationships, and the dignity inherent in the natural birth process. The study will look at *Isizwe*, focusing on how AWT disrupts ancestral continuity, procreative rituals, and the foundational role of the mother within the family unit, and *Umhlaba*, exploring how AWT poses challenges to the sanctity of the natural world and the spiritual consequences of a technological intervention into a sacred ecological process.

5.2.1 Implications for Ubuntu (Humanity and Community)

According to Ewuoso & Hall (2019:98), African communities tend to avoid emphasising individual distinctions because doing so can set one person against another; therefore, the emphasis shifts from the individual to the group. The Zulu indigenous belief system of communalism and collective identity, which is based on *Isintu* and the *Ubuntu* philosophy, faces significant challenges from the practice of gestation outside of a human body and in an artificial womb. For Zulu people, conception, reproduction, and childbirth are communal processes that embody the values of interdependence, belonging and shared responsibility

within '*abantu bakithi*' which means our people and kinship connection (Ewuoso and Hall, 2019:98; Fagunwa, 2019:50). According to this viewpoint, the involvement of an individual in community life is the means by which they gain personhood and humanness. The birth of a child is widely recognised and celebrated as a significant social and spiritual event. In addition to the mother and father, the extended family and community play a role in pregnancy, childbirth, and childrearing; they offer spiritual direction, emotional support, and physical assistance (Tshivhase and Moyo, 2025:7; Mulkey, 2024:51). By moving conception and gestation from the communal, societal, and cultural realm into a controlled, clinical, and mechanical environment, artificial womb technology individualises and technologizes the communal process that is sacred and important in Zulu society. The role of the community, elders, and ancestors who take part in and sanctify the process of giving and bringing life into the world through traditional and cultural beliefs and rituals can be eradicated through the use of artificial womb technology.

5.2.1.1 The Erosion of Umuntu (Personhood) and Isidima (Dignity)

Personhood, or '*umuntu*', in *Isintu*, is attained through social integration and communal and societal recognition and given at birth (Ewuoso and Hall, 2019:98). There are concerns over spiritual legitimacy of childbirth and whether a child born in an artificial womb, without the embodied experience of a being in a mother's womb and without the involvement of ancestors, truly belongs into the collective moral order. According to Fagunwa (2019:50), traditional and cultural beliefs and norms, such as the spirits of the homeland and a metaphysical connection that shapes the universe, influence both individual and collective identities. The interconnectedness of identity and culture plays a significant role in an individual's search for meaning, as it helps define their identity, values, origins, and life purpose; however, the introduction of AWT may disrupt these metaphysical connections and the cultural transmission of identity, challenging an individual's sense of origin and belonging. For Shange (2025:2), the principle of *umuntu ngumuntu ngabantu* (a person is a person through other people) influences the notion of personhood. In Western bioethics, personhood is often associated with cognitive ability or autonomy (Baranzke, 2020: 20). Ewuoso and Hall (2019: 96) assert that, from the Ubuntu perspective, personhood is relational and inherent. An individual attains personhood by engaging with the community, receiving recognition and identity, and participating in the collective's moral way of life. This contrasts with the possible gestation of a child in a laboratory's isolation. The child born with AWT enters the world without having experienced the connection with ancestors and the community. This poses a question, from a Zulu

indigenous perspective, about whether human beings gestated in such a technological environment ever fully attain the relational personhood that Ubuntu calls for. This means that newborns produced or born in an artificial womb may not be considered "real human beings" in Zulu communities and may be excluded from both the family and the larger Zulu community or society. Artificial womb technology may further isolate these newborns from the rest of the community. The spiritual and moral bonds that are an essential aspect of the collective identity can be eroded by artificial womb technology, because the technology isolates the process of pregnancy and childbirth from these communal processes. Based on this, artificial womb technology not only redefines and transforms the biological act of reproduction, but it also questions the ethical and metaphysical basis of Zulu identity, where being 'umuntu' means being born into a web of relationships that confirm one's origin, sense of belonging, and moral obligation. According to Soni (2025:73), although a fetus is not granted legal personhood under South African law before birth, it may be regarded as a legal subject under the nasciturus fiction, which means a legal principle that safeguards the rights of a preborn child who is born alive. The advancement of artificial wombs challenges this idea, concerning viability. Traditionally, viability denotes the capacity of a fetus to exist independently outside the womb, with or without neonatal support.

According to *Ubuntu*, the process of creating life outside of these social and spiritual structures disrupts Zulu personhood, which is achieved through one's relational integration and moral development within the community (Ewuoso and Hall, 2019:96; Van Breda, 2019:440). Artificial womb technology poses a threat to the sacred interconnectedness that defines and characterises life, motherhood, personhood, and belonging in Zulu Indigenous culture, undermining the ancestral and relational bonds that uphold humanity within *Ubuntu*, according to an *isintu*-based ethical perspective. The idea of '*isidima*,' or the intrinsic dignity that both the mother and the child inherit through the natural process of reproduction, is threatened by artificial womb technology. The mother's '*isidima*' is connected to her respected role as the nurturer and life-giver, an inherent part of her social and spiritual identity that commands respect. The artificial wombs transfer the sacredness of pregnancy and childbirth, which is the role of a woman, to a machine, which can be viewed as devaluing women's exceptional contribution, turning a sacred role into a mere biological procedure. The dignity (*isidima*) of the child is inherent in their dignified arrival into the world along the human path rooted in tradition and ancestral lineage. This means that *Isidima* represents a spiritual force of presence and influence that an individual possesses, which is enhanced by leading an upright life and,

crucially, by having a strong and respected lineage. Artificial womb technology disrupts this spiritual force. A person with a distinct and respected link to their ancestors is recognised as having *isidima* (dignity) (Molefe, 2020:5). According to Molefe (2020:7), a child with a background marked by technological uncertainty and a break in the ancestral lineage may be viewed as lacking *isidima* (dignity). They lack the essential spiritual endorsement derived from being conceived and gestated under ancestral guidance. This perceived deficit is both social and metaphysical; it may render the individual more susceptible to misfortune, illness, or spiritual attack, as they lack the full protective influence of their ancestors (Molefe, 2020:7).

Artificial womb technology poses a threat to *Isizwe* by encompasses not only social belonging but also spiritual vulnerability, thereby affecting the existential security of individuals within the Zulu cosmology. Births that take place in a lab, away from the warmth and spiritual sanctity of the mother's womb, run the risk of lowering the child's intrinsic dignity and moral worth from the very beginning of their life by depicting their origin as a mechanical product.

5.2.1.2 The Disruption Ubudlelwane (Interconnectedness)

According to Ntshangase and Zulu (2024:8), *Ubuntu* in society is regarded as the backbone of life, guiding almost all structures of African community life and building 'ubudlelwane' relationships within the continent's culture and identifying 'ubudlelwane', a principle of interconnectedness between individuals, as a central pattern that manifests within the broader worldview. According to Zulu thought, life is not an isolated possession; however, it is achieved through continuous engagement and interaction with other people and the broader web of creation (Van Breda, 2019: 440). With the invention of artificial womb technology, the concept of 'ubudlelwane', or interconnectedness, is significantly undermined. AWT undermines the physical closeness of pregnancy, disrupting the first and most essential bond between mother and child, which serves as a sacred tether to the ancestors themselves. This bond is a community event that prepares the entire family and community to meet the new member, rather than a private one. With the adoption of AWT, the community is denied the connection with the newborn built through prayer. *Isintu* is rooted in *Ubuntu*, where "communing with others" refers to more than interacting with actual living people; it also refers to the fundamental interconnectedness of all life in the natural and spiritual worlds (Ewuoso & Hall, 2019:96). This fundamental relational circuit is disrupted by the artificial womb, resulting in a symbolic and physical divide between mother and child where a deep bond should exist. Romanis (2023:90) introduces the term "fetotate" to characterise the distinct entity of a fetus in ectogestation, which is neither fully a fetus nor a newborn. According to Soni (2025:73), this

suggested term differentiates this being from both a fetus (in utero) and a neonate (post-birth), acknowledging its distinct ontological and cultural status. From an *Isintu* perspective, the fetonate is characterised by a significant degree of relational disconnect. In the AWT, the child is not embodied with the ancestors nor is it in the mother's womb; and it is not yet present in the community of the living. This presents a bioethical dilemma absent in natural gestation, and raises questions about the moral responsibilities of the community toward the fetonate. In *Ubuntu*, obligations are relational. The fetonate, developed in artificial wombs, lacks relational embodiment. This technological innovation places the fetonate outside the networks of care and responsibility that characterise *Ubuntu*. The community is unable to conduct protective rituals for the child, the mother cannot establish a bond through shared bodily experience, and the artificial barrier of the biobag disrupts the connection to ancestors. The fetonate poses a challenge to the importance of '*ubudlelwane*', as it is an entity for which the community finds it difficult to determine its responsibility, given that technology has situated it beyond the relational context that imparts meaning to ethics. *Ubuntu* is an ethical paradigm that unites the spiritual and natural realms. This moral theory is founded on the notion that an individual ought to view themselves as related to and interrelated with the spiritual world, and that an individual is never fully human when they are not a part of connections of kinship, community, and spirituality (Ewuoso & Hall, 2019:96). These ties between the ancestors and the living can be disrupted by the introduction of artificial wombs, which prioritises integrating technological elements into processes that the Zulu people consider significant and sacred, connecting them to their ancestors who protect and guard them. This technology can lead to the Zulu people becoming more vulnerable to adverse events like illnesses and death. The interference in reproductive processes prevents '*ubudlelwane*' from developing naturally from the beginning, which could result in a relational deficiency that affects the child's integration into the broader human community and damages the community foundation that *Ubuntu* strives to maintain.

5.2.1.3 The Disruption of *Ukuzala* (Childbirth) and Community Inclusion

According to Zulu culture, a child is a child of the people, recognising that a child is not just the biological offspring of their parents but also of the entire community. According to Fagunwa (2019:50), this belief system serves as the foundation for *Ubuntu*'s collective identity and moral obligations, which hold that maintaining life and harmony depends on mutual care and shared humanity. As Gugulethu (2025:305) stated, reproduction is a biological and spiritual duty for the Zulu, and giving birth (*ukuzala*) respects and perpetuates the family line. Artificial womb technology altogether changes a spiritual and sacred process that is shared among the Zulu

people into a medical procedure or another medical experiment. By redefining reproduction as an individual or technologically mediated process and detaching it from the social, communal, and ritual contexts that affirm collective belonging, AWT thereby challenges this community ethic. According to Zulu tradition, conception and childbirth, which means '*ukuzala*' or '*ukuzalwa*', are social occasions that encourage communal participation through songs, ceremonies, and rituals that guarantee ancestral blessings and celebrate fertility (Vargas, 2025:3; Mulley, 2024:51). The significance of '*ukuzala*' is multifaceted; it is viewed as the primary mechanism through which the ancestral chain is actively maintained and strengthened, thereby fulfilling a sacred duty to the past and ensuring the vitality and future prosperity of the lineage (Gugulethu, 2025:305). Given that it isolates an individual or child created using an artificial womb, artificial womb technology disrupts these customs of social participation through ceremonies, songs, and rituals that value the ability to conceive and reproduce as a blessing from the ancestors. The advent of artificial womb technology presents a challenge to the sacred continuity of traditional reproduction, as it threatens the modification of procreation into a separate process, which could disturb the spiritual and ancestral bonds created through the natural cycle of pregnancy and childbirth. As a result, children are more than individual children; they are also crucial to the ancestors and the family's spiritual sense of identity as a whole. They are the new descendants in a chain that connects the past, present, and future. Moving the process of pregnancy to an artificial womb makes it hard for society to be inclusive of children born through an artificial womb and give people clear identities and social roles. This means that children born using an artificial womb may be welcomed in society; however, without the sacred traditions and practices that introduce a newborn into the ancestral chain and the community, their route to belonging would not be in alignment with their ancestors, leaving a gap in their social and spiritual identity.

5.2.2 The Effects on *Isizwe* (Lineage, Ancestry, and Continuation)

According to Magoqwana (2025:3769), *Isizwe* is a Nguni understanding of society that derives from the collective of people (*abantu*), which is known as the clan and lineage, and is a spiritual continuum connecting the living, the unborn, and the ancestors (*amadlozi*). The Zulu people are one of the prominent ethnic groups in South Africa; they have distinctive cultural norms regarding reproduction. The Zulu culture values ancestral lineage and prioritises keeping family lines intact. Pregnancy and childbirth are biological and spiritual processes that involve rituals and ceremonies designed to strengthen community ties and bonds. Similar to other cultures, taboos in Zulu society help maintain moral behaviour. Artificial womb technology disrupts and

disregards the respect and role of taboos in Zulu society. In Zulu culture, taboos are sacred prohibitions designed to regulate the moral framework and avert misfortune by placating fate and the ancestors (Dlamini-Myeni et al, Mazibuko et al, & Shumba et al, 2024: 44). AWT, by externalising the sacred process of gestation, violates core taboos surrounding the sanctity of the natural conception and childbirth, actions considered immoral and incorrect by supernatural beliefs. For the Zulu people, this transgression is not a simple cultural misstep but an invitation of spiritual disharmony and ancestral displeasure, severing the vital connection to their lineage and inviting the misfortunes the taboos were established to prevent.

Dlamini-Myeni et al, Mazibuko et al, and Shumba et al (2024:44) argue that taboos are notions that are not meant to be expressed, including words and expressions that are forbidden from use. From an Indigenous Zulu viewpoint, artificial womb technology poses a threat as it interferes with sacred spiritual and ancestral rules that formed to protect the Zulu people even during pregnancy, it undermines the fundamental process of creation to a mechanical procedure, and it further erodes the essential taboos and rituals that sustain moral order and communal bonds.

The notion of *'imvelaphi yakho'*, representing an individual's origin, is a fundamental aspect of Zulu identity, connecting the person to their maternal lineage, *'isibongo'* clan name, and ancestral land (Mondlana, 2019:61). The relocation of conception and gestation into a machine results in the loss of the notion and relational dimensions that affirm *'imvelaphi yakho'* and the spiritual connection. The technological detachment from natural and maternal processes risks fostering a disembodied existence that may lack spiritual grounding and relational authenticity within *Isintu*. Mondlana (2019:74), a significant concept in Zulu culture, is the questioning *"ungowakabani sibongo?"* meaning "what is your surname?" This question connects an individual to their family, ancestors, and spiritual realms. This connection is ritually symbolised through *inkaba*, which connects the mother to the child, the burial of the umbilical cord and placenta on family soil, which signifies belonging, spiritual continuity, and the child's rootedness within both the land and lineage (Matholeni, 2019:430). Artificial womb technology disrupts the essential spiritual continuity between physical and spiritual realms, crucial for a child's rootedness. With the child being developed and born through an artificial device, it complicates the ability to address the fundamental question *'ungowakabani'*, as traditional methods of establishing lineage are compromised. Ultimately, this innovation poses a risk of cultural and spiritual dislocation, which can disconnect individuals from the core of their Zulu identity.

Isizwe's cultural system comprises language, rhythm, spirituality, and values that have long been integral to African culture. All of these elements are important in Zulu culture because they help define the Zulu people. Traditional Zulu beliefs may be called into question by the development of artificial womb technology. People may oppose using this kind of technology because it separates delivery from spiritual and natural processes. This is because traditional Zulu beliefs connect reproduction to gender roles, spiritual symbolism, and respect for ancestors. Women are believed to be the bearers of life and to possess a spiritual gift that connects the present generation to their ancestors (Kukora, 2023: 1338). The artificial womb technology severs the spiritual connection between the ancestors (*amadlozi*) and the unborn, a connection that *Isizwe* believes is vital for the protection and blessing of a child. By transferring gestation from a sacred, naturally governed process to a technologically controlled environment, AWT disrupts the spiritual conduit that runs through the mother's body and the associated rituals. The artificial womb lacks the qualities of moral consciousness, as Zulu cultures assert that a person is not considered a complete human without a connection to their ancestors. In this context, an infant developed in an artificial womb may not be acknowledged by the ancestors, since the spiritual process that connects the unborn child to its ancestors through the mother's body and associated rituals is interrupted. This detachment raises significant ethical questions about the spiritual validity of life. For the Zulu people (*Isizwe*), this act is *ihlazo*, which means a transgression as it creates a child who may lack ancestral recognition and the essential '*umoya*' that binds an individual to their lineage, thereby calling into question the child's very spiritual identity and place within the community.

5.2.2.1 The Disruption of *Amasiko Okuzala* (Rituals of Procreation)

In Zulu culture, pregnancy and childbirth are sacred life stages deeply embedded in a network of ancestral and ritual practices that affirm the interconnectedness between the spiritual and physical realms. McGarry (2023:17) asserts that pregnancy is a journey during which the expectant mother performs ancestral prayers, observes food restrictions, and engages in cleansing rituals to ensure the child's well-being, in which these practices are absent in the use of artificial womb technology, raising serious concerns about the continuation of '*amasiko okuzala*'. According to traditional Zulu beliefs, every stage of life, from conception to birth, growth, and death, is marked by rituals that reaffirm the connection between the person, the community, and the spiritual world (Ndunga, 2025:8; Ewuoso and Hall, 2019:96). Rituals which include '*imbeleko*', the ritual for introducing a newborn, '*inkaba*', the ritual of burying the umbilical cord, and '*ukuphahla*', the ritual of pleading ancestors for help, are crucial for

showing that the newborn belongs to both the living family and the ancestral lineage. Artificial womb technology has significant implications for the future and meaning of these rituals, as it removes the natural processes of conception and gestation from the supervision and control of ancestors and places them in the hands of technology. Traditional Zulu belief holds that a child's life is sanctified and safeguarded through ancestral participation from the moment of conception. This raises the question of whether people must continue to perform these rituals when the ancestors were not part of the conception stage. Dlamini (2024:1969) notes that pregnancy is treated with secrecy and reverence to protect the unborn from evil spiritual entities, along with specific taboos that are adhered to preserve harmony among the mother, the unborn child, and the ancestors. Artificial womb technology disrupts the sacred connection between ancestors and spiritual guidance by gestating a fetus outside the human body in a technological machine biobag and diminishing a sacred process that is safeguarded and declared sacred through ritual. The rituals that honour the presence and protection of ancestors over both mother and child lose their significance when the child is born outside the human body.

The *Imbeleko* ritual is a significant cultural ceremony that introduces a newborn to the ancestors and secures their blessing, a rite rooted in the context of natural gestation and childbirth (Ramaube et al, Du Plessis et al, & Mogale et al, 2022: 41-42). The introduction of artificial womb technology raises a critical spiritual dilemma as to whether ancestors can acknowledge a child born through ectogestation and whether such a child would be eligible to wear the isiphandla. This goatskin band signifies ancestral acceptance. This raises the question of whether a child can be ritually integrated into a lineage if the ancestors do not recognise a gestation process that occurred outside the maternal body and the sacred natural order. Artificial womb technology removes the mother's embodied experience of these sacred processes, thereby challenging the ritual's cultural logic and symbolic power. The use of an artificial womb for child development raises questions about the necessity and effectiveness of the '*imbeleko*' ritual. The lack of maternal gestation can provoke the anger of the ancestors, as the family introduces a child conceived through a technological device. A child may experience spiritual disconnection and life difficulties due to the ancestors' wrath. The '*ukubikwa*', which means the introduction of a child to ancestors, relies on the natural birth process that links both mother and child to the metaphysical realm. Thus, rituals like *ukubikwa* are undermined by the advent of artificial womb technology.

From this perspective, as the ancestors may not recognise a child gestated in an artificial womb, it lacks the legitimate connection to '*abantu bakubo*', which means one's people. This severance from the ancestral realm means the child exists outside the spiritual and communal bonds that define personhood and belonging in the Zulu worldview. The '*inkaba*' ritual of burying the umbilical cord serves as a physical and spiritual connector, associating the individual with their heritage and ancestral roots. According to Matholeni (2019:430), this ritual fosters a sense of belonging and a deep connection between identity, ancestry, and land. The ritual of burying the umbilical cord signifies the ancestors' acknowledgement, protection, and acceptance of the child. The absence of maternal experience and the *inkaba* ritual create confusion in the symbolic acknowledgement of origin and belonging, threatening the individual's relations to lineage and the moral community that informs identity (Matholeni, 2019:430; Ndlovu, 2021:221). With artificial womb technology, the umbilical cord and placenta may not retain their natural forms or be synthetically created in a laboratory, thereby diminishing the ritual's inherent sacred authenticity. The failure to bury the *inkaba* in ancestral soil can signify a separation from ancestral bonds, leaving the child without a spiritual foundation linking them to family, land, and community. Artificial womb technology disrupts this sacred ritual of burying '*inkaba*' as the Zulu people cannot bury a synthetic umbilical cord. The absence of this ritual act undermines the symbolic and spiritual significance of burying the cord, as *inkaba* represents an individual's origin and spiritual connection to ancestors. The implications of failing to perform the ritual burial of the umbilical cord, or *inkaba*, within Zulu society are understood to vary in their severity. These outcomes range from minor social transgressions, such as a child bedwetting at an older age, to severe spiritual and physical calamities. It is believed that failing to inter the *inkaba* can bring misfortune, chronic illnesses, and even death, as it represents a critical disruption to the child's connection to their ancestors, the land, and the spiritual order. (Matholeni, 2019:430).

Gugulethu (2025:305) notes that the ritual of '*ukuphahla*', which means pleading with the ancestors, strengthens the ancestral relationship by allowing family members to communicate with and plead with the ancestors for protection, health, and prosperity after the birth of a child. The replacement of natural childbirth with artificial womb technology causes questions concerning the legitimacy and appropriateness of conducting '*ukuphahla*' for a child born outside the traditional processes sanctioned by ancestral oversight. The ritual practice of *ukuphahla*, which involves burning incense and pleading with the ancestors, is rooted in the principle that life is a direct bestowal from the ancestral realm. This ceremonial act of pleading

for children explicitly acknowledges the ancestors (*amadlozi*) as the ultimate grantors of existence and continuity; therefore, the efficacy and significance of the ritual may be called into question if life is generated through laboratory and technological devices (Noge & Maditsi, 2025:181). This technology challenges this continuum by removing the sacred moments that enable the community to affirm life's ancestral origin and by eroding the rituals through which identity, belonging, and protection are granted. As a result, artificial womb technology is not just a biomedical intervention but a cultural and spiritual disruption that redefines how life is understood, blessed, and integrated into the Zulu ancestral order.

Within the Zulu traditions, there are cultural norms that have guided the way of life, such as the tradition of '*Ukungenwa*'. In Zulu culture, the implementation of artificial womb technology, which facilitates gestation outside the human body, poses a significant challenge to old practices that ensure family continuation. AWT disrupts the practice of '*ukungenwa*', a levirate ritual intended to provide biological family succession. While *ukungenwa* serves as a traditional solution for infertility or widowhood, AWT presents a biological alternative that threatens to undermine these social constructs, challenging the core of Zulu patrilineal identity and familial organisation. In the Zulu culture, this tradition transcends a medical remedy for childlessness; it serves as a robust social institution that fortifies familial bonds and ensures patrilineal continuity. According to Memela (2022:36), '*ukungenwa*' is performed to prevent the reclamation of lobola from the bride's family in the event of the husband's death, leaving a young widow without children and disrupting the family's lineage expansion. The tradition permits the husband's brother to procreate with his brother's wife, ensuring the woman stays within the husband's lineage and that the children are acknowledged as the direct heirs of the dead or infertile husband. By establishing familial ties and guaranteeing the continuation of the family name and history through a regulated tradition, '*ukungenwa*', the Zulu tradition turns a possible lineage crisis into a reaffirmation of the patriline.

In Zulu societies, *ukungenwa* is based on close relationships; artificial womb technology offers a way to reproduce that is not tied to family relationships. *Ukungenwa* is a social inclusion rite that combines procreation with reaffirmation of clan obligations and relationships (Memela, 2022:36). AWT, however, severs this sacred link that has been practiced in Zulu societies for years by relocating gestation to a clinical, impersonal environment. This act of externalisation undermines the ceremonial importance of the procedure; a child born in an artificial womb, utilising a dead husband's saved sperm, is developed without the kin group's approval. Thus, while the infant may be a biological child, its social status remains uncertain. The technology

solves the problem of physical gestation. However, it fails to address the cultural prerequisite of social acceptance, creating a child whose place in the patrilineal structure is uncertain and contested because it was not conceived through the mandated sacred womb designed. The practice of *'Ukungenwa'* embeds collective responsibility, duty, and the subordination of individual desire to the needs of the lineage. The availability of AWT, as an individualistic technology-mediated solution, shifts away from these African traditions towards a more Westernised, biomedical model of reproduction. Over time, this could lead to the erosion of cultural practices that form part of the Zulu people. Hence, the adoption of AWT in Zulu cultures challenges cultural traditions that are essential to preserving patrilineal continuity.

5.2.2.2 The Erosion of the Ancestral Respect and Lineage

In Zulu cosmology, *'amadlozi'* or *'izinyanya'* (ancestors) are regarded as the givers of life. Ancestors are honoured and play a vital role as spiritual mediators in African traditional religions (Diko, 2025:3). Zulu people believe that life is spiritual, grounded in their interconnectedness with ancestors, who are believed to influence and modify events in the lives of the living. Hence, when a child is conceived within the Zulu people, it is understood that the ancestors have sanctioned and bestowed life upon that family. Artificial womb technology poses a significant challenge to the Zulu conceptualisation of life. In African religious thought, ancestors, defined as those who have departed the visible realm, are considered to exist in the invisible and metaphysical domains. The ancestors serve as moral guardians, act as intermediaries with the divine, and directly influence health, fertility, and fortune. Their role in reproduction is active and influential, rather than just passive or symbolic. They are thought to facilitate fertility and bestow the blessing of offspring, with the external gestation, artificial womb technology disrupts the spiritual intermediation of conception. The function of the ancestors is to provide protection and guidance, which is secured through ritual communication and negotiation. The rituals ensure ancestral protection and confirm the new member's acceptance into the community's spiritual lineage. AWT, by relocating gestation from the spiritually maternal body to a laboratory setting, excludes ancestral influence from the process. This technology may have grave consequences on the child's and the family's welfare, attracting the ancestors' wrath in the form of illness or misfortune. The ancestors remain influential and engaged in familial matters, serving as guardians, mediators, and moral authorities. In the previous chapter, Goeieman (2022:14) indicated that ancestors aim to guide their descendants, assist them in making significant decisions, and participate in important events in their lives; hence, with artificial womb technology, the guidance of ancestors may be disregarded, as

individuals will seek the help of technological devices, rather than consulting and pleading with ancestors. As in the relationship between a parent and a child, ancestors often influence their descendants, encouraging them to make better decisions and adopt a better way of life; however, the adoption of artificial wombs may disregard ancestors' capacity to guide and protect their descendants.

Banda (2019:215) argues in the previous chapter that a distinction between the spiritual and the physical is nonexistent. In African religious thought, '*amadlozi*' or '*abaphansi*' are considered to exist in a state of personal immortality. This concept is externalised through the physical continuation of individuals through procreation, whereby children inherit the traits of their deceased parents or forefathers. The potential introduction of artificial womb technology could lead to a diminished interconnectedness between ancestors and future generations. Individuals developed in artificial wombs may lack inherited traits from their forebears, leading to a sense of disconnection from their lineage. Artificial womb technology contributes to the erosion of cultural beliefs and traditions that guide the Zulu people and their way of life, affecting identity and belonging in Zulu society, where ancestral continuity defines one's moral, social, and spiritual standing. Banda (2019:215) emphasises that maintaining a balance between the material and spiritual worlds is essential for good health and a fulfilling life. Artificial wombs, by substituting the natural gestational environment with a technological one, compromise this harmonious balance. The mechanisation of life creation through technology may be perceived as a challenge to ancestral authority, as it disregards the sacred intermediaries acknowledged as the givers of life and guardians of fertility within Zulu traditions and beliefs. Some may contend that the influence of ancestors can extend to new technologies when approached with respect; however, the core principle that life arises from ancestral blessing is fundamental to Zulu thought. Artificial womb technology redefines this conception of reproduction and destabilises the cosmological foundations of ancestry, spirituality, and moral order in Zulu societies that regard ancestors as the givers of life. Artificial womb technology raises worries that any child born would not be exposed to the proper ancestors and that she and the child will suffer as a result, raising questions about how to explain children born using third-party technology to their ancestors.

Ancestral spirits are believed to be in communication with the fetus, ensuring its safe arrival into the world (McGarry, 2023:17). Artificial womb technology may be seen as disrupting that communication, violating the spiritual connection that links a child to its ancestors and family lineage by removing the natural gestation process and detaching it from the mother's body.

AWT serves as both a biomedical intervention and a cultural and spiritual disruption, redefining the understanding, blessing, and integration of life within the Zulu ancestral order. Due to the perception that children born in artificial wombs lack spiritual validity or ancestral blessings, this could lead to social opposition. This calls for an evaluation of whether a child conceived through an artificial womb can maintain a ritualistic and spiritual connection to the ancestral framework that, over time, has defined humanity within *Isintu*. In Zulu cultures, pregnant women are required to adhere to strict moral and spiritual standards, including the avoidance of specific foods, actions, or locations deemed spiritually hazardous (Dlamini-Myeni et al, Mazibuko et al, & Shumba et al, 2024:52). This technique may be considered meaningless in the context of artificial womb technology, as the child will be in an artificial womb machine, hence, Zulu traditions and norms that are of importance cannot be performed, as a fetus in an artificial womb depends on artificial amniotic fluid introduced into the nutrient supply chamber to sustain its development. Traditional midwifery, prayers, and symbolic rituals constitute integral components of the birthing process, emphasising community involvement in childbirth. In Zulu societies, midwives are older women in the community with years of experience in traditional birth. They provide essential physical care during pregnancy and childbirth, including monitoring the mother's health, advising on nutrition, and assisting with the delivery itself. In Zulu societies, midwives perform critical cultural and spiritual duties, including guiding the burial of the umbilical cord (*inkaba*). AWT disrupts the role of midwives, prayers of the community in childbirth, since it is developed in a scientific environment, the midwives are unable to play their role in pregnancy and childbirth. Singh (2022:204) asserts that this technology challenges conventional norms by extricating gestation from the human body, potentially violating natural law and ethical standards across diverse cultural and religious viewpoints. In this context, pregnancy represents a communal process of '*umoya*' and spiritual journey in which the child's essence is shaped by ancestral traditions, maternal care, and community support (Twikirize et al, Tusasiirwe et al, and Mugumbate et al, 2023:167). Artificial womb technology can undermine the spiritual interconnectedness of '*umoya*' between ancestors and the child. The absence of conception and development within the natural womb of a biological woman can lead to the child lacking the spiritual conduit necessary for the connection of ancestral energy and '*umoya*' with the newborn.

In Zulu culture, ancestors serve as guardians and protectors of their descendants, shielding them from misfortune, illness, and evil forces (Goeieman, 2022: 14). If African people neglect their ancestors, who guide life decisions through dreams and signs, and choose to depend on

technological innovations that disrupt natural birth processes, they may lose the protection offered by their ancestors. In Zulu culture, ancestors are believed to safeguard their descendants. Therefore, when reproduction and birth occur through technological means rather than through natural processes overseen by '*abaphansi*,' it can result in spiritual warfare. This suggests that ancestors may experience difficulty in identifying or establishing a connection with a child born through artificial means rather than natural processes. This could anger the ancestors, leading them to punish their descendants through sickness, calamities, and death. From a Zulu Indigenous perspective, artificial womb technology may disrupt the continuity of the ancestral line, as ancestors are not engaged in the gestation process. Clark (2021:49) asserts that the failure of one generation to acknowledge the influence of their ancestors can result in the disruption and erosion of traditions. The potential implementation of artificial womb technology in Africa may result in the Zulu nation losing its connection to ancestral heritage. Thus, artificial womb technology presents ethical and cultural dilemmas within Zulu society as it challenges the ancestral conception of life, eroding the importance of ancestors and their guidance. It compels a reassessment of the significance of sacred life, what is required to identify a life-giver, and whether AWT can be adopted in an African context that values traditional belief systems.

5.2.2.3 Undermining The Role of the Mother and Umndeni (Family)

From Zulu perspectives, humans transcend the physical realm, existing in interconnectedness through '*umoya*'. The mother serves as both the physical bearer of life and the spiritual conduit through which '*umoya*' ancestral energy is transmitted to the unborn child (Diko, 2025:3; Gwacham & Thomas, 2022:483). In Zulu culture, the womb is a sacred space, serving as a vessel of ancestral power where life is formed under ancestral guidance (Musie et al, Anokwuru et al, Ngunyulu et al, and Lukhele et al, 2022: 104). Hence, a child developed in a technology that lacks the ancestral blessing of natural conception and the sacredness of a mother's womb (*isibeletho*) may be considered spiritually illegitimate or "unnatural," thus having a different, and possibly lower, form of societal worth. By externalising gestation, AWT challenges the sacred maternal role exclusive to women, as it circumvents the womb, a revered vessel of ancestral power, where life is conceived under ancestral guidance. Artificial womb technology generates a tension between the intense desire for a child and the potential spiritual and social implications associated with the circumstances of the child's birth. This asserts that reproduction in Zulu societies acknowledges the mother's womb as the child's origin and extends beyond the physical aspects of birthing to encompass the spiritual dimension. The shift

from natural processes to scientific and technological processes for gestation contradicts the Zulu way of life.

In African indigenous thought, the mother serves as a vital link between the child, the family, the ancestors, and the community. The mother is a vessel through which life enters the world (Aziza, 2020:258). Artificial womb technology breaks the bond between a mother and her child during pregnancy and after birth. The role of the mother, referred to as '*indima yomama*,' may be diminished to that of an egg provider in the introduction of artificial womb technology. The disruption of the mother's role can contribute to a lack of emotional connection between the mother and the child. Artificial womb technology presents a risk of dissociating womanhood from the powers of conception, gestation, and childbirth. The replacement of the biological woman's womb by machines could lead to a disregard for the concept of motherhood, thereby altering and disrupting existing social structures and gender-based respect. In Zulu society, womanhood and motherhood are deeply interconnected. Hence, the womb of the mother serves as the sacred vessel that connects this identity to both the spiritual and physical realms; the use of such technology can terminate this connection. In the case of a child gestated in an artificial womb, the question of spiritual ownership raises ethical and philosophical considerations regarding parenthood and identity. The father's genetic contribution is evident, while the mother's function as the life-giving vessel is replaced by a machine. This results in a disruption of the symbolic order. Artificial womb technology raises cultural questions about whether the child can inherit the ancestral blessings and a connection with the mother. The technology introduces ambiguity within the kinship system, potentially resulting in offspring who are genealogically Zulu yet spiritually disconnected. This may result in the emergence of new, problematic social categories, wherein children are biologically related to the clan but face challenges regarding their spiritual belonging.

The ability to conceive and give birth grants women a revered status within the family and society (Dlamini-Myeni et al, Mazibuko et al, & Shumba et al, 2024:52). Artificial womb technology as an alternative to natural pregnancy may disrupt traditional gender roles and raise concerns about how women's societal status will be affected. In Zulu societies, naming traditions, ancestral acknowledgement, and clan-based identity are fundamental to social structure (McGarry, 2023:18). The absence of a physical maternal connection could disrupt lineage continuity, creating uncertainty about the child's place within the clan and traditional family structures. With artificial wombs, the natural bond between mother and child, reinforced through pregnancy and breastfeeding, becomes mediated using technology, challenging the

very idea of motherhood as both a spiritual and relational identity. In Zulu nature and tradition, a baby is meant to be born in the womb. In a natural pregnancy, the physiological connection between mother and child, facilitated by the umbilical cord, establishes a foundational bond. The disruption of this natural process by human intervention is seen as disrupting the work of the ancestors. Hence, the introduction of artificial womb technology disrupts the interconnectedness between a mother and her child, since the umbilical cord of an artificial womb would be synthetic and medically modified in the laboratory by doctors and scientists. Artificial womb technology disrupts womanhood and motherhood by infringing on women's nature to conceive and give birth.

5.3.3 Implications for Umhlaba (Ecology, Nature, and the Sacred)

The respect is for all living things, humans, animals, plants, the earth, and spiritual beings are connected (Nche and Micheal, 2025:5). Artificial womb technology disregards respect for nature and the natural processes of life, because within the Zulu people, such respect is a central ethical principle that guides human beings' relationship with their environment and the cycles of existence. Life is viewed as a continuous cycle that depends on the balance between nature, humans, and the ancestors. Hence, conception and birth are considered part of this divine cycle, in which life comes into being through a natural balance between the spiritual and physical worlds. Artificial womb technology makes it possible to create and grow a fetus outside of a human body using advanced machines. To develop an embryo in an artificial womb, an artificial amniotic fluid is put into the nutrient supply chamber (Medori, 2023:244). Artificial womb technology disrupts the Zulu worldview rooted in *Isintu*, where respect for nature and the natural processes of life form the foundation of human existence and spirituality. Within Zulu cosmology, conception, pregnancy, and childbirth are sacred natural processes guided by ancestral and spiritual forces that sustain the balance between the physical and metaphysical realms (Mkhize, 2018:28; Nche and Michael, 2024:6). AWT, therefore, challenges the moral and cosmological order of respecting '*imvelo*' and the natural way of life, wherein life, spirituality, and community have an inherent connection (Knoetze, 2019:3). In this context, life flows through '*imvelo*' nature, which stands for the divine ordered rhythms of existence and the connections between all living and non-living things (Mkhize, 2018:28). By taking conception and gestation out of the human body into an artificial environment, artificial wombs change the natural order that *Isintu* seeks to protect. This disrupts the spiritual, ancestral, and ecological aspects of life creation.

5.2.3.1 The Erosion of Ukuhlonipha Imvelo (Respect for Natural Processes)

Zulu tradition emphasises the importance of coexistence with '*imvelo*' (nature), prioritising harmony over domination and alteration of natural processes. Natural processes are regarded as expressions of divine wisdom; thus, they warrant respect and preservation. With artificial womb technology, the unborn child develops outside the mother's body, thereby disregarding natural processes of life, the biological and spiritual connection among the mother, ancestors, and the earth. The child's existence becomes linked to technological and scientific processes rather than to natural and ancestral cycles, posing a threat to Zulu cultures and traditions, which perceive life as an eternal cycle of nature and spirit. In Zulu society, respecting nature entails honoring the processes of life, including natural conception, the physical connection between mother and child, and the sacred communication with ancestors during pregnancy and childbirth (Dlamini, 2025:1972); Nche and Michael, 2024:13). In Zulu traditions, interference with natural processes and moving gestation to a technological device is considered more than a technological innovation; it is a moral violation against ancestors and the divine order of *imvelo* (Moyo, 2021:128). The process is externalised and mechanised, diverging from its intended organic, internal nature, closely linked to the rhythms of the female body and the land. This represents a form of ecological alienation, wherein human reproduction is removed from its natural context and situated within a sterile, regulated, technological device. From an *Isintu* perspective, the potential spiritual consequence is a disruption in the flow of life force. The ancestors, thought of as living within natural elements, may not acknowledge or be able to bless a life process occurring in a synthetic environment. This may disrupt the spiritual ecosystem, affecting not only the individual child but also the family's fertility and well-being. The technology, in its efforts to alter nature, is viewed as causing spiritual chaos. Therefore, concerns may arise regarding the artificial production of children, with concerns that those born from artificial wombs might be viewed as socially or morally different, potentially lacking the cultural connections developed through maternal experiences. Artificial womb technology mechanises and externalises the gestational process, substituting the spiritual connection among mother, child, and ancestors with technological intervention. This transformation challenges the conventional perception that natural processes are sacred phenomena that necessitate respect and formal recognition (Ohaja and Anyim, 2021: 3).

In the Zulu Indigenous beliefs, pregnancy and delivery outside of the natural womb upset the ancestors' spiritual order and the balance between people and '*imvelo*' nature. The belief that ancestors reside in natural elements, such as land and air, overseeing life processes through

natural means (Nche and Michael, 2024:13), suggests that artificially replicating these processes may be viewed as undermining or disrespecting ancestral authority and natural processes of life. The ethical question of whether life produced by AWT is considered a complete human being, as life conceived through natural processes, is brought up by this change in natural processes. This technology, which aims to replicate natural gestation processes, risks undermining natural processes by separating birth from its natural, ancestral context. In harmony with the moral cycle of life (Dlamini, 2025:1972), the introduction of artificial womb technology raises a challenge to the Zulu ethical commitment to a harmonious relationship with nature and the respect for the sacred rhythms that dictate life and reproduction.

5.2.3.2 The Degradation of the Sanctity of *Isibeletho* (Womb)

The initial environment for a child is the maternal womb. With artificial womb technology, the creation, nurturing, and birth of a human being transition from remaining a natural and sacred process into a service controlled by medical institutions, corporations, or private investors. This transformation risks altering societal perceptions of life, shifting it from a sacred, relational concept to one that is purchased, controllable, or manufactured. Artificial womb technology can lead to the industrialisation of reproduction by relocating the sanctity of the womb and birth to laboratories and clinics, thereby transforming a previously human and spiritual process into a biological industry. Barla (2025:349) states that the commodification of life is the transformation of human existence and reproduction into objects with commercial value or trade potential. AWT can contribute to the commercialisation of reproduction, allowing companies to profit from the creation of life, thereby transforming '*isibeletho*', an entity venerated for its connection to nurture, fertility, and sacred femininity in African traditions, into a technological tool that lacks its emotional and cultural significance. This process undermines the sanctity of the '*isibeletho*' (womb) by separating procreation from its spiritual and communal context. Al Ahmed et al, Abadla et al, and Al Ansari et al (2024:1) assert that the commodification of life raises concerns regarding the sanctity of life.

The commercialisation of life and reproduction signifies a moral degradation in development, as technological advancements serve a small number of individuals, thereby compromising communal development and equity. From an African moral perspective rooted in *Isintu*, human life should not be commodified. The commercialization of reproduction erodes its ethical foundation, detaching it from relational responsibility and spiritual connection, thereby undermining the bonds that '*ukuzala*' (childbirth) carries. Artificial wombs present an obstacle

to the communal and spiritual fabric that characterises humanity within Zulu and broader African contexts. The transformation of procreation into a commercial enterprise through AWT can lead to the commodification of life, substituting moral relationships with market dynamics and diminishing the sacredness and interconnectedness that characterise human existence. The Artificial womb technology commodifies the conception period and spiritual readiness. Al Ahmed et al, Abadla et al, and Al Ansari et al (2024:1) contend that the creation of artificial wombs would commodify the entire pregnancy process and run the risk of turning the developing child into a "thing" rather than a relationally complex human being. This implies that the adoption of artificial womb technology would result in the dehumanisation of artificial womb child and their treatment as a commodity. Gestation in nature is a nine-month cycle that serves as a period of spiritual preparation for the mother, family, and community. This period is designated for rituals, guidance, and the cognitive and spiritual transition into parenthood and new community responsibilities. AWT, by enabling precise control over the gestation completion, commodifies time. The duration of pregnancy may be altered for technical or convenience reasons, detaching the process from its natural rhythm. This interrupts the spiritually designated period of preparation. A child may be born according to a technician's schedule rather than completing the 9-month spiritual process, denying the family the opportunity to participate in essential rituals or pursue ancestral dreams and signs.

The introduction of a technological, corporate intermediary transforms the communal narrative of origin. The child's life narrative commences not with the sacredness and mystery of conception and maternal gestation, but rather with a scientific procedure and technological device (Romanis and Adkins, 2024:302). This can undermine the child's dignity and sense of inherent worth, as their origin is characterised as a manufacturing process rather than a divine gift from their ancestors. The transition from a life received to a life produced through an artificial womb poses a significant challenge to the Zulu traditions and cultures. In many African societies, and within Zulu culture, reproduction and childbirth are regarded as sacred processes that extend beyond the biological to encompass spiritual, communal, and ancestral dimensions. These processes are rooted in *Isintu*, which represents humanity, moral order, and respect for the interconnectedness of life. The act of childbirth symbolises continuity between the living and the ancestors, and the womb is viewed not only as a physical link between mother and child but also as a spiritual bond anchoring one's identity within the community. Recreating this natural process through technological means risks disrupting the sanctity and symbolic significance of birth as understood in Zulu traditions. As artificial womb technology offers

immense potential for medical and social progress, it raises fundamental ethical and cultural questions about the preservation of cultural identity, spiritual integrity, and the moral factors of African life. This tension calls for a thoughtful, respectful dialogue about how technological innovation can coexist with Indigenous value systems.

5.3 CONCLUSION

In conclusion, through the perspectives of *Isintu* and the indigenous Zulu worldview, this chapter has critically explored the ethical and cultural implications of Artificial Womb Technology (AWT). This chapter has demonstrated that while AWT is a brilliant scientific and medical advancement that can enhance biomedical technology, increase reproductive freedom, and reduce maternal and newborn mortality, it raises various ethico-cultural implications and conflicts with fundamental moral, cultural, and spiritual beliefs in Zulu society. Pregnancy and childbirth are viewed as sacred rituals that validate collective identity, spiritual belonging, and intergenerational continuity in the Zulu worldview, which is based on the interdependence of the living, the ancestors, and nature. From the analysis, it becomes evident that AWT disrupts these sacred relationships by transferring gestation from the natural womb, a space sanctified through ancestral guidance, to a mechanical environment devoid of spiritual grounding. This technological intervention not only undermines the spiritual role of the ancestors but also erodes rituals such as *imbeleko*, *inkaba*, and *ukuphahla*, which serve as vital cultural expressions of belonging and protection. Furthermore, AWT poses significant ethical challenges related to the commodification of life, gender roles, and communal identity, as it risks transforming reproduction from a relational and moral act into a commercial and individualistic enterprise. AWT has the potential to erode *ukungenwa*, not through direct prohibition, but by rendering its philosophical and spiritual underpinnings obsolete, thereby disconnecting future generations from a vital repository of cultural knowledge, ancestral reverence, and social identity. Such disruptions threaten the harmony that *Isintu* seeks to preserve between humans, ancestors, and nature. Is it possible for AWT to be integrated into African cultures and traditions?

The use of AWT is confined to critical, last-resort medical situations. Furthermore, it would require either creating new rituals or carefully applying existing ones to address the spiritual disruptions caused by the technology. A child born from AWT may necessitate a specially organised, more complex *Imbeleko* ceremony, which involves senior elders and diviners sincerely pleading with the ancestors for acceptance and protection. The *inkaba* ritual may be conducted with more respect, utilising a symbolic object in the absence of a natural placenta

(Matholei, 2019: 430). This represents an effort to spiritually reconstruct the child's origin narrative, reintegrating them into the ancestral context from which technology separated them. In African traditions, the separation of gestation from the natural processes of a mother's womb is too significant to be mended through any sacred rituals. The necessity of such extraordinary measures underscores the significant cultural violence the technology imposes. Although the theoretical framework suggests adaptive potential, the actual implementation of AWT within Zulu society's current structure may encounter substantial opposition, resulting in pronounced social stratification and increased spiritual unease. The examination reveals that the ethnocultural implications are mainly negative, indicating a significant conflict of values that is not easily reconcilable. The preservation of the *Isintu* lifeworld relies on a resistance to this technological paradigm, or at the very least, necessitates a cautious approach, thorough ethical examination, and a fundamental commitment to preserving ancestral continuity and communal integrity.

In conclusion, this chapter acknowledges that technological innovation and Indigenous traditions need not exist in opposition. Instead, their coexistence requires dialogue, cultural sensitivity, and ethical frameworks that honour both scientific progress and the sacredness of life as understood within African cosmologies. It is through such a balance that African societies, the Zulu people, can navigate the moral tensions posed by AWT embracing its benefits while safeguarding the values, rituals, and communal ethics that constitute the essence of *Isintu* and Ubuntu. The findings of this chapter, therefore, lay the foundation for the next chapter, which will present the study's summary, conclusions, and recommendations for integrating emerging biotechnologies with indigenous ethical systems to promote both innovation and cultural preservation.

CHAPTER 6

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

6.1 INTRODUCTION

The previous chapter analyzed the ethical and cultural implications of artificial womb technology using the ethical and cultural concepts embedded in the *Isintu* theoretical framework. The chapter revealed the significant moral challenges that develop when a technology that externalizes human gestation confronts a worldview in which life, procreation, and identity are deeply embedded in spiritual, ancestral, and communal relationships. The chapter revealed how AWT undermines fundamental Zulu Indigenous concepts of the sacred maternal vessel (*isibeletho*), interferes with vital rituals of belonging such as *imbeleko* and *inkaba*, and risks commercializing a process regarded as a divine and ancestral blessing. The previous chapter established that, from a Zulu perspective, adopting this technology transcends a mere medical decision, with significant implications for the community's moral ecology and its relationship with the ancestors.

This chapter builds on that fundamental analysis and concludes the study, providing a thorough overview, a definitive conclusion, and recommendations for the future. The chapter aims to summarize the key arguments and findings established during the investigation. This chapter begins with a conclusion that summarizes the main idea and highlights the complex dual nature of AWT, both as a potential medicinal advantage and as a significant cultural and spiritual concern within Zulu Indigenous norms. The chapter provides a summary, outlining the process of each chapter. This section outlines the process, beginning with the initial recognition of the research problem, the review of the literature on artificial womb technology, and the theoretical framework of *Isintu*, which guides the study. It then explores artificial womb technology through the lens of *Isintu*, a philosophy rooted in *Ubuntu*. This chapter offers recommendations for African scholars, policymakers, and community leaders. These recommendations outline measures for developing an integrated connection between technological innovation and Indigenous Knowledge Systems, emphasizing inclusive dialogue, ethical frameworks rooted in African philosophy, and the preservation of cultural integrity in advancing science. This chapter concludes the research by reflecting on the key contributions and advocating a framework for future exploration of artificial womb technology that is ethically responsible and culturally sensitive.

6.2 Conclusion

This study examines the ethico-cultural implications of artificial womb technology (AWT) from a Zulu Indigenous perspective, guided by the *Isintuism* theoretical structure rooted in the philosophy of *Ubuntu*. The study concludes that artificial womb technology offers significant scientific and medical potential. The study presents complex moral, cultural, and spiritual challenges that require careful consideration within the African context. The emergence of artificial womb technology presents a biomedical advancement. It raises significant ethical and cultural questions regarding the nature of life, motherhood, and the continuity of human existence as understood within *Isintu*. The study concludes that, from a Zulu Indigenous perspective, reproduction involves more than biological processes; it also encompasses moral, ancestral, and communal dimensions of existence. The introduction of AWT into African societies, and within the Zulu community, has an integral connection to the spiritual and cultural norms that shape personhood and identity.

This study outlines significant ethical and cultural considerations essential to the design of research trials involving artificial womb devices. The study indicates that *Isintu* functions as an ethical, moral, and spiritual system, focusing on the interconnections between the living, ancestors, and the unborn. Life is regarded as sacred, descending from the divine and mediated by ancestral power, thereby ensuring continuity across generations. Artificial womb technology externalizes gestation, challenging the metaphysical relationship by shifting the creation of life from the sacred maternal body to a technological device. This shift raises significant ethical questions about the legitimacy of life conceived and nurtured outside traditional, natural norms. In Zulu moral perspectives, pregnancy and childbirth are viewed as acts of spiritual participation, with the womb (*isibeletho*) functioning as the sacred vessel that mediates life between ancestors and the living. Thus, artificial womb technology presents a threat to the moral and spiritual connections among the mother, the child, the community, and the ancestors. The adoption of artificial womb technology without engaging in ethical and cultural discussions constitutes a form of technological colonization that undermines Indigenous knowledge, despite its potential to enhance reproductive autonomy, save premature infants, and offer new reproductive options. The moral evaluation of AWT from a Zulu Indigenous viewpoint should prioritize the harmony that sustains life and community, rather than focusing on utility or efficiency. The study establishes that considerations of artificial wombs in Africa ought to balance technological advancement with the preservation of cultural integrity, respect for ancestors, and community welfare. The future depends on embracing

innovation while thoroughly investigating it through the moral principles of *Isintu*, ensuring it serves humanity and not taking away from it.

6.3 Summary

The study includes chapters that propose using a Zulu Indigenous philosophical and ethical framework to comprehend and evaluate artificial womb technologies. The first chapter introduces the background and rationale for the study, emphasising the growing scientific interest in AWT and the ethical need to consider its implications in African contexts before its adoption. The chapter outlined the significance of Indigenous perspectives in global bioethical discussions, which have been dominated by Western perspectives, by presenting the research problem, objectives, and guiding questions. It pointed out that while AWT presents solutions for maternal mortality, infertility, and premature birth, it further disrupts deeply rooted cultural notions and understandings of motherhood, spirituality, and human continuity in African societies.

The second chapter examined existing literature on artificial womb technology and the African Indigenous perspective on reproduction. This chapter identified the key debates around the development, purpose of artificial wombs, and ethical challenges presented by artificial womb technology. Scholars such as Romanis (2021, 2024), De Bie (2023), and Horn (2022) provided a global bioethical context by analysing artificial womb technology in relation to fetal rights, gender equality, and reproductive justice. The chapter noted that AWT has been conceptualised as a transformative medical intervention that could save premature infants and offer reproductive autonomy. However, African scholars such as Omolola, Oduwole, and Adebayo (2023) and Njane (2022) emphasised that, while the technology may have clinical advantages, its integration must be approached with caution, respecting human dignity and cultural norms. The literature further explored the African Indigenous perspective on reproduction, showing that African societies, including the Zulu, regard it as both a spiritual and communal event. Motherhood is not only a biological function but a sacred role that connects the living to the ancestors. Rituals such as (*imbeleko*), introducing the child to the ancestors, and (*inkaba*), burying the umbilical cord, signify the child's spiritual grounding within the lineage. The chapter established that, in this worldview, the womb is a moral space, not a neutral organ, and any technology that interferes with it must be evaluated for its spiritual consequences. It further identified a research gap in the absence of Indigenous African frameworks for evaluating AWT, which justified the need for this study.

The third chapter focused on the method and methodology framework governing this study, justifying the adoption of a qualitative research design with a descriptive focus to facilitate a comprehensive understanding of the ethico-cultural implications of Artificial womb technology from a Zulu Indigenous perspective. The study adopted a qualitative desktop approach, involving the systematic collection and critical analysis of secondary data from academic journals, books, and philosophical texts. The study employed the Describe-Evaluate-Consult-and-Act (DECA) method as an analytical procedure, serving as a structured framework for ethical decision-making. The DECA method guided the study through a systematic description of AWT as a moral and cultural issue, evaluating its implications through the lens of Isintu principles, a review of existing literature, and a movement toward actionable, culturally grounded recommendations, thus ensuring a critical, ethical, and culturally informed analysis.

The fourth chapter introduced *Isintuism* as the guiding Afrocentric theoretical lens. *Isintuism* and *Ubuntu*, together, emphasize communal living, moral reciprocity, and harmony among humans, ancestors, and nature. The chapter explained that *Isintuism* calls into question the division between the physical and the spiritual, viewing all life as interconnected and sacred. Within this framework, ethical evaluation is not individualistic; the communal rightness of an act is judged by its contribution to social harmony and ancestral balance. The chapter further elaborates on the principles of *Isintu*, such as (*ukuhlonipha*) respect, (*ubudlelwane*) relationship, and (*ukuphila kahle*) living well. These principles provided a culturally grounded foundation for analysing the moral implications of artificial womb technology. This chapter examined the role of ancestors in Zulu spirituality, noting that ancestors (*amadlozi* or *izinyanya*) are not distant beings but living presences who guide and protect their descendants. Birth and death are transitions within the same continuum of life, and disrespecting ancestral processes disrupts the moral order. Therefore, technologies that interfere with gestation and birth must be assessed in light of their impact on ancestral relations and the community's moral relation. The chapter concluded that *Isintuism* provides a decolonial, contextually appropriate framework for evaluating the ethical dimensions of artificial womb technology in a manner that affirms African cultural identity and values.

The fifth chapter then applied the theoretical framework to examine the ethico-cultural implications of AWT from a Zulu Indigenous perspective. The chapter revealed several layers of moral tension. Artificial womb technology disrupts ancestral spirituality by externalising gestation, thereby breaking the sacred connection between the unborn child, the mother, and the ancestors. From the Zulu perspective, conception is an ancestral blessing; thus, when life

begins outside the womb, it lacks the moral sanction that ensures spiritual continuity. The chapter examined how AWT challenges rituals of conception and birth, such as *imbeleko*, *inkaba*, and *ukuphahla*. These rituals affirm belonging and ancestral recognition. Without maternal gestation, their meaning and significance are undermined, raising the question of whether ancestors could still recognise a child born through artificial means as a full member of the lineage. The analysis also discussed how artificial womb technology might alter the ethical relationship between humans, nature, and the ancestral order. Within *Isintu*, life is sustained through (*imvelo*) nature, which represents divine harmony. AWT, by shifting gestation to a laboratory, disturbs this equilibrium and introduces the commodification of life. This industrialisation of reproduction risks transforming the sacred act of creation into a commercial process governed by profit rather than moral value. Finally, the chapter acknowledged the potential benefits of AWT, such as reducing maternal mortality, assisting infertile couples, and saving premature infants. Yet, it concluded that these benefits must not overshadow the moral obligation to preserve cultural identity and spiritual equilibrium. The ethical challenge, therefore, lies in finding a balance between embracing innovation and safeguarding the moral foundations of *Isintu*.

The study fulfilled the first objective in the second chapter, establishing the global bioethical discourse on AWT and defining the Zulu perspective, where reproduction is sacred, an ancestral process. The fourth chapter then presented the *Isintu* principles (*ukuhlonipha*, *ubudlelwane*, *ukuphila*, *kahle*). The fifth chapter fulfilled the second objective through the application of *Isintu* to identify the conflict of disruption of spiritual continuity and rituals like *imbeleko* and *inkaba*, the challenge to notions of motherhood and gender roles, and the tension between technological intervention and the natural and ancestral order. The fourth chapter outlined the development of the third objective to examine the way the theory of *Isintu* can inform the ethical implications of AWT. The chapter outlined the application, using the principles of *Isintu* to evaluate AWT as an intervention within a moral ecology. *Isintu* shifts the ethical evaluation from individual autonomy to communal harmony and ancestral balance, offering a distinct normative lens that prioritises relationality, spiritual consequence, and the preservation of cultural identity amidst technological change.

6.4 Recommendations

Al Ahmed et al, Abadla et al, & Al Ansari et al (2024:1) argued that the rapid progression of technology in the biomedical sector, including the development of artificial womb technology, raises significant ethical, moral, and cultural questions. The implications of technological

innovations within the cultural frameworks of African and Zulu people are complex, despite their potential to improve reproductive health, lower maternal mortality rates, and provide assistance to individuals who are unable to conceive within the natural process. African indigenous perspectives, grounded in *Isintu*, stress relationality, spirituality, and the interconnectedness of all existence (Moyo, 2021:128). As technology advances, Africa and the Zulu people face a moral obligation to ensure that scientific advancements align with the principles and beliefs that define African humaneness. Maintaining the sacred aspects of life that guide African societies, respect for ancestors, rituals, the interconnectedness of life, womanhood, motherhood, communal identity, and the natural processes of conception, pregnancy, and birth, while embracing modern technological developments such as artificial womb technology (AWT), is a challenge.

According to Medori (2023:245), further investigation and study on the ethical and cultural implications are crucial before AW technology can be adopted and used as a medical procedure on people. Recent advances in this science have led to increased attention to the ethical and cultural implications of using artificial wombs for neonatal life support. Moloto (2024:22) asserts that achieving balance requires establishing a synergistic interaction between Indigenous Knowledge Systems (IKS) and modern scientific innovation, therefore ensuring that technical advancement is rooted in culture. African philosophies possess ethical insights and wisdom; hence, integrating African wisdom into science and technology can foster restorative and sustainable development practices that guide technological application while preserving culture and traditions (Ndasauka, 2024:169). Their contribution of African philosophies will ensure that modern technical advancements align with African ethical and spiritual principles, rather than contradict them. Incorporating Indigenous Knowledge Systems into biological ethics will promote decision-making that is inclusive, sensitive, and reflective of communal values (Mkhize, 2018:28; Murove, 2023:92).

The adoption or implementation of Artificial Womb Technology (AWT) in Africa has not yet occurred; however, it is essential to initiate conversations regarding the ethical, cultural, and policy implications of this technology. The emergence of artificial womb technology as a tangible reality is becoming increasingly inevitable due to the ongoing advancements in science worldwide; therefore, regulation is necessary to ensure that AWT research and its potential clinical applications are ethical (Romanis et al, Begovic et al, and Mullock et al, 2021:826). This regulatory imperative calls for concrete institutional action. According to Thaldar et al, Soni et al, Prinsen et al, Mnyandu et al, Botes et al, and Kinderlerer et al (2025:6), the national

bioethics bodies, such as the South African National Health Research Ethics Council (NHREC), can establish a dedicated multidisciplinary advisory committee on Artificial reproductive technologies. This committee should be mandated to include traditional leaders, indigenous knowledge holders, and clinical experts to draft culturally informed guidelines and review proposed research. This means that African societies, scholars, and legislators must engage in critical reflection over the alignment of such technology with Indigenous moral values, cultural beliefs, and social systems. Commencing these discussions now will ensure that when AWT reaches African contexts, its implementation will be informed by ethical sensitivity, cultural understanding, and respect for African perspectives, rather than by external technology influences.

According to various scholars, including Omolola et al, Oduwole et al, and Adebayo et al (2023:15), for Africans to benefit from the opportunities the technology offers women and families, they must engage in a thorough discussion of its advantages and challenges without compromising their traditional values. African nations may facilitate a future in which technological innovations enhance and enrich, rather than disregard, the cultural traditions associated with pregnancy, childbirth, ancestral responsibilities, and motherhood. The study proposes an ethical framework that balances technological innovation and spiritual commitment. The principle of balance should guide research and policy decisions. Despite its potential to improve health outcomes, technological innovation must not compromise cultural values that support human dignity and identity. Intercultural discussions, including scientists, ought to respect *Isintu's* belief that life is interconnected and sacred. Academic institutions and medical facilities can thus create interdisciplinary programs that integrate bioethics, African philosophy, and reproductive health studies to foster culture-inclusive innovation.

According to Willems et al, Heltzel et al, Nabuurs et al, Broerse et al, and Kupper et al(2023:7), education and dialogue on reproductive technological innovations across these systems would better ensure that decisions are grounded in moral and cultural considerations rather than in scientific principles. By integrating Indigenous wisdom into bioethical discussions, Africa can establish innovative ethical frameworks that balance tradition with innovation. Scientists, ethicists, and traditional knowledge holders can engage in open discussions that bridge Indigenous wisdom and modern science (Willems et al, Heltzel et al, Nabuurs et al, Broerse et al, and Kupper et al, 2023:7). Misunderstandings can arise when technical progress is viewed as being in opposition to cultural norms. The implementation of AWT in the future necessitates

a strong moral education grounded in *Isintu*. This understanding will ensure that future scientists and lawmakers approach new technology advancements with respect for African culture and ethical responsibility, as well as their relationship with scientific progress. The implementation of AWT must not challenge rituals and traditions that connect communities to their ancestors. African leaders ought to preserve, maintain, and reinterpret rituals such as *imbeleko*, *inkaba*, and *ukuphahla* to ensure their relevance in an era of scientific progress. Cultural norms can be maintained through storytelling, oral traditions, and intergenerational conversation. According to Okesanya (2024:2), communities must be engaged to prevent ethical violations and ensure that the technology aligns with local values and beliefs. By preserving these narratives, communities retain their beliefs while adapting to modern society. Traditional leaders and healers must be aware of technological developments that challenge African traditions and norms, enabling them to interpret and modify rituals while preserving their spiritual significance in the face of an evolving reality. This engagement establishes a connection between the past and future, ensuring that Africa's ethical perspective continues to influence its technological progression.

6.5 CONCLUSION

This study concludes that, while artificial womb technology offers potential solutions to various reproductive health issues, its implementation from a Zulu Indigenous viewpoint raises significant ethical and cultural challenges that call for careful and sensitive consideration. The summary outlined how the study progressed from identifying a gap in the literature regarding Indigenous African frameworks for evaluating artificial womb technology, to developing a cultural analytical lens using *Isintuism*, and to implementing this lens to reveal the ethical implications of AWT on ancestral spirituality, sacred rituals, and the communal understanding of personhood. Furthermore, the chapter's recommendations suggest a future in which cultural identity is not sacrificed for technological advancement. This study recommends an ethical and cultural approach, calling for multicultural dialogue that bridges the gap between scientific innovations and traditional knowledge holders. To guide future consideration of AWT in African contexts, there is an emphasis on the pressing need to develop ethical guidelines and policy frameworks grounded in *Isintu* ideals, such as '*ukuhlonipha*' (respect) for ancestors and spirituality and '*ubudlelwane*' (connections) between the ancestors, the community, and nature. By recognising *Isintu* as a suitable philosophical framework for assessing future technologies, this study contributes to African bioethical literature. The study emphasises the necessity of technology and advancements to support and improve humanity in ways that respect dignity,

community, and spirituality. Instead of focusing on whether modern innovations should be adopted, the question that needs to be raised is how these innovations can coexist with traditional knowledge and cultural values. As Africa faces the inevitable progress of science, adopting technologies such as AWT calls for a return to *Isintu*, being human in the face of change. Zulu Indigenous beliefs assert that advancements in reproductive technology in Africa should be grounded in humanity, spirituality, and the interconnectedness of the living, ancestors, and the unborn. This chapter has thus achieved its objective of providing a thorough conclusion to the research while outlining an ethical, culturally grounded approach to the development of reproductive technologies.

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Confirmation of Editing

To whom it may concern,

This is to confirm that I, Sinethemba Charity Cele, on a professional basis, completed the proofreading and language editing of the Master of Arts (MA) dissertation submitted by Ms Samkelisiwe Mthwane (Student Number: 221017100).

Artificial Womb Technology: Evaluating the Ethico-Cultural Implications from a Zulu Indigenous Perspective

As requested; The Thesis was edited. Editing consisted of the following:

- *Proofreading and editing
- *Spelling and grammar correction
- *Clarity and Overall Writing Style

Date: 27 November 2025

Sincerely,
Charity Cele (Editor)



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