

EMPOWERING WOMEN THROUGH EDUCATION

5.0: ZIMBABWE'S DRIVE TOWARDS INDUSTRY AND SUSTAINABLE DEVELOPMENT

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Abstract

As Zimbabwe advances towards innovation and industrialisation, the women's role in development is central to achieving national progress. However, persistent barriers such as gender bias, limited access to education, and structural constraints continue to hinder their full participation in economic and industrial sectors. This study explores how Education 5.0, a heritage-based philosophy embraced by the Women's University in Africa and the Zimbabwe Ezekiel Guti University (ZEGU), integrates gender equality and human rights into teaching, learning, and professional development. Using a mixed-methods qualitative case study approach, the study examines how Education 5.0 empowers women by enhancing their skills, leadership, and participation in industrialisation. The research analyses Kuziva neKugona/Ukwazi lokwenelisa, an indigenous knowledge framework that fosters problem-solving education, practical training, and community engagement. Case studies highlight women's successes in technology and business, showcasing the tangible impact of gender-inclusive education. Findings demonstrate that Education 5.0 aligns with Zimbabwe's industrialisation policies and global frameworks such as Sustainable Development Goal (SDG 5) (Gender Equality) and SDG 9 (Industry, Innovation, and Infrastructure). The study underscores the need for stronger gender integration in education policy to enhance economic resilience and industrial competitiveness.

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Women's empowerment through Education 5.0 is essential for sustainable development. The study calls for immediate action to scale gender-inclusive educational models across sectors, ensuring women's contributions to national economic growth are fully realised.

Key words: *empowerment, education, gender gap, underdevelopment*

INTRODUCTION AND BACKGROUND

THE ROLE OF WOMEN IN ZIMBABWE'S INDUSTRIALISATION

Zimbabwe's pursuit of innovation and industrialisation hinges on empowering women as key drivers of national development. Despite comprising a significant portion of the population, women remain underrepresented in sectors such as technology, entrepreneurship, and industry. Yet, their potential to stimulate economic growth and social transformation is undeniable. Historically, women in Zimbabwe have faced systemic barriers to education and economic participation, rooted in cultural norms, gender stereotypes, and limited access to resources. These challenges have perpetuated a cycle of inequality, where women are often confined to traditional roles and excluded from leadership positions in industrial and technological fields. However, as Zimbabwe strives to achieve its Vision 2030 goals, which prioritise industrialisation and economic growth, the need to harness the full potential of its female population has become increasingly urgent.

To bridge this gap, the Zimbabwe Ezekiel Guti University (ZEGU) has embraced the adoption of Education 5.0, a ground-breaking educational model designed to foster inclusion, develop practical skills, and create opportunities for women to drive meaningful change. It comes across as a transformative model that re-imagines the purpose of learning. Grounded in Zimbabwe's rich heritage and aligned with its aspirations for industrialisation, this approach integrates teaching,

research, community engagement, innovation, and industrialisation (Ministry of Higher and Tertiary Education, Science and Technology Development, 2018a). It redefines education's purpose, focussing on preparing graduates for immediate industry impact.

THE EVOLUTION FROM EDUCATION 3.0 TO EDUCATION 5.0

Education 5.0 represents a fundamental shift from conventional education models, unlike its predecessor, Education 3.0, which focused primarily on teaching, research, and community service. The new framework incorporates innovation and industrialisation as additional pillars. This holistic approach emphasizes practical skills, problem-solving and hands-on learning, entrepreneurial training and business incubation, ensuring graduates are equipped to apply their knowledge in real-world industries. This model moves beyond producing job seekers, instead cultivating industry-ready, tech-savvy entrepreneurs capable of creating employment opportunities and driving economic growth.

For women, Education 5.0 serves as a critical tool to overcome barriers such as limited access to education, cultural biases, and restricted economic participation. By integrating gender equality into its core principles, Education 5.0 seeks to dismantle the structural barriers that have historically excluded women from participating fully in Zimbabwe's industrial and technological domains.

EDUCATION 5.0 AND GLOBAL DEVELOPMENT FRAMEWORKS

This model aligns with global development frameworks, particularly the United Nations Universal Declaration of Human Rights (1948) and the United Nations Sustainable Development Goals (SDGs). Specifically, it supports:

- *SDG 5 (Gender Equality)*: Advocating elimination of discriminatory practices and ensuring women's full and active participation in economic and social life.

- *SDG 9 (Industry, Innovation, and Infrastructure)*: Focuses on inclusive industrialisation and technological advancement, fostering innovation as drivers of sustainable economic growth.

By empowering women through education, Zimbabwe can unlock a new wave of innovation and economic growth, positioning itself as a leader in progressive educational reform and gender equality in Africa.

COMPARATIVE ANALYSIS: EDUCATION 3.0 VERSUS EDUCATION 5.0

The transition from Education 3.0 to Education 5.0 marks a significant shift in educational strategy:

In terms of gender inclusion, Education 3.0 inadvertently supported gender stereotypes through its lack of specific gender-focused policies, leading to lower female participation in Science, Technology, Engineering and Mathematics (STEM) and leadership roles. In contrast, Education 5.0 actively promotes gender inclusivity with targeted curricula and leadership programmes, resulting in increased female involvement and leadership in previously male-dominated fields.

While Education 3.0 was more academic, often leaving a skills gap, Education 5.0 emphasizes practical, hands-on learning, preparing students for immediate industry impact. This approach has notably enhanced employability and entrepreneurial capabilities among women.

Education 3.0 treated innovation as a by-product rather than a central aim. Education 5.0, however, places innovation at its core, encouraging students to engage with and shape industry through incubators and direct industry partnerships, particularly empowering women to innovate.

The shift from Education 3.0 to Education 5.0 marks a paradigmatic change in how education in Zimbabwe views and implements gender inclusion, practical skill development, and innovation. Education 5.0 addresses the shortcomings of its predecessor by creating a more inclusive, practical, and innovative educational environment. This model not only prepares students for the current job market, but also equips them to shape future industries, with a significant emphasis on empowering women. However, the success of Education 5.0 hinges on continued policy support, cultural acceptance, and the commitment of educational institutions to adapt and evolve these practices further.

Beyond the classroom, the impact of this model is already evident. Women trained under Education 5.0 are pioneering technology-driven healthcare solutions, leading industrial ventures, and driving sustainable agricultural practices.

However, the implementation of Education 5.0 is not without its challenges. Despite its potential, the model faces obstacles such as underfunding, inadequate infrastructure, and cultural resistance which continue to hinder its ability to achieve its full potential. Addressing these barriers is critical to realising the transformative potential of Education 5.0 in fostering gender equality and economic growth.

This research explores how Education 5.0 serves as a transformative framework for empowering women in Zimbabwe. It examines the intersection of education, gender, and industrialisation, highlighting real-world examples of women benefiting from this approach. Additionally, it assesses the model's alignment with national and global development agendas, identifies key challenges, and proposes strategies for expanding its impact. At its core, it argues that empowering women through education is not just a developmental goal – it is the foundation for Zimbabwe's future as an inclusive, industrialised nation.

CONCEPTUAL FRAMEWORK

CONCEPTUALISING WOMEN’S EMPOWERMENT THROUGH EDUCATION 5.0

This study is anchored in the Education 5.0 framework, which integrates teaching, research, community engagement, innovation, and industrialisation as key pillars of higher education reform in Zimbabwe. The model aims to bridge the gap between academia and industry, equipping graduates, particularly women, with practical skills, entrepreneurial capabilities, and technological expertise to drive national development.

At the heart of this framework are two interconnected theoretical perspectives.

THE GENDER AND DEVELOPMENT THEORY

This Gender and Development Theory (GAD Theory) emphasizes the structural barriers that limit women’s participation in economic and industrial growth. The GAD Theory posits that gender inequality is not merely a result of individual choices, but is deeply rooted in societal structures, cultural norms and institutional practices. It argues that systemic gender inequalities must be addressed structurally to achieve sustainable development.

This perspective is crucial in the Zimbabwean context where recent critiques argue that traditional roles still significantly dictate women’s economic participation, as evidenced by studies from the Zimbabwe Gender Commission (2023) which highlights persistent gender disparities in access to resources, decision-making, and leadership roles. GAD Theory pushes for:

- removing socio-economic barriers to women’s progress.
- ensuring equal access to education and employment opportunities.

By addressing these structural barriers, Education 5.0 seeks to create an enabling environment where women can fully participate in and contribute to Zimbabwe's industrialisation efforts.

THE HUMAN CAPITAL THEORY

This theory, initially conceptualised by Schultz (1961), emphasizes that investment in education and skills development is crucial for economic growth and national productivity, thus, highlighting the role of education in enhancing skills, productivity and economic opportunities. For women, education serves as a critical tool for breaking the cycle of poverty and inequality, enabling them to access better-paying jobs, start their own businesses and contribute to their communities. In Zimbabwe, where economic recovery and development are critical, this theory supports skill enhancement for economic participation, with a focus on women to break cycles of poverty and inequality. Recent studies, such as those by the World Bank (2022), have critiqued the application of human capital in developing countries, noting that while education increases productivity, systemic barriers can still hinder women's advancement unless accompanied by broader social reforms.

Education 5.0 aligns with this approach by:

- developing industry-aligned skills through innovative cultural programmes
- equipping women for leadership in industrial sectors, recognising that leadership roles are crucial for influencing policy and practice.

By combining the insights of the GAD Theory and the Human Capital Theory, Education 5.0 provides a comprehensive approach to women's empowerment, addressing both the structural barriers and the individual capacities needed for women to thrive in industrial and technological sectors.

The framework is structured as follows:

1. *Inputs:* These include policies, institutional frameworks (Education 5.0), and support systems (scholarships, mentorship, funding). These elements form the foundation for women's empowerment, providing the necessary resources and opportunities for women to access education and training.
2. *Processes:* Encompassing Skill development, innovation training, and industry-oriented learning. These processes ensure that women acquire the necessary competencies, practical skills and knowledge needed to succeed in industrial and technological fields
3. *Outputs:* Increased female participation in industrial sectors, entrepreneurship, and leadership. outputs reflect the tangible outcomes of education 5.0, demonstrating its impact on women's economic and social empowerment.
4. *Outcomes:* Enhanced economic inclusion, job creation, and sustainable national development aligned with SDG 5 (Gender Equality) and SDG 9 (Industry, Innovation, and Infrastructure). These outcomes highlight the broader impact of Education 5.0 on Zimbabwe's industrialisation goals and its alignment with global development frameworks.

By analyzing this framework, the study examines how Education 5.0 serves as a transformative tool for women's empowerment, linking educational reform to industrialisation and sustainable economic progress. The framework also provides a roadmap for policymakers, educators, and industry leaders to implement gender-inclusive educational models that address the unique challenges faced by women in Zimbabwe.

PURPOSE AND SCOPE

This study investigates Education 5.0 as a transformative framework for empowering Zimbabwean women at the nexus of education,

gender, and industrialisation. Through real-world examples, it highlights the model's impact on women's contributions to vision 2030 goals. Additionally, it evaluates its alignment with national and global development priorities, drawing on international case studies to contextualise its potential. The research identifies implementation challenges and proposes strategies to enhance its effectiveness, arguing that empowering women through education is not merely a developmental objective-, but the cornerstone of Zimbabwe's emergence as an inclusive, industrialised nation.

LITERATURE REVIEW

Education 5.0 represents a paradigm shift in Zimbabwe's higher education, integrating teaching, research, community engagement, innovation, and industrialisation to align with national development goals (UNESCO, 2020). Unlike previous models, it focuses on practical skill development, entrepreneurship, and problem-solving, aiming to bridge academia and industry. This section reviews literature on women's empowerment, barriers to their participation in industry and technology, and Education 5.0's potential in addressing gender disparities. It also explores technology adoption, leadership training and policy impacts, drawing from African and international perspectives to contextualise educational influences on gender equity. It also highlights gaps in research and policy implementation for future exploration.

BARRIERS TO WOMEN'S EMPOWERMENT IN INDUSTRY AND TECHNOLOGY

Despite global and regional strides toward gender equality, women in Zimbabwe encounter persistent structural, institutional, and attitudinal barriers in industry and technology. These barriers can be classified into structural, institutional, and attitudinal factors (Kabeer, 2010). These challenges, deeply rooted in socio-cultural norms and

systemic inequities, limit women's contributions to economic and technological advancement.

SOCIO-CULTURAL BARRIERS

Gender stereotypes and biases remain pervasive, discouraging women's engagement in STEM and industrial sectors (UN Women, 2020). In Zimbabwe, cultural norms often restrict women to domestic roles, side-lining leadership opportunities (Adebayo, 2020). Mawere (2020) notes that such expectations stifle career aspirations, a trend echoed across sub-Saharan Africa where patriarchal structures similarly constrain women's professional growth (African Union, 2021). Internationally, studies from the Organisation for Economic Co-operation and Development (OECD) countries reveal parallel attitudinal hurdles, underscoring a global need for cultural shifts (OECD, 2019).

INSTITUTIONAL AND POLICY OBSTACLES

Institutional barriers, including limited access to quality education and industry-relevant training, restricts women's skill acquisition (Adebayo, 2020). Zimbabwe's policy frameworks have historically lagged in supporting women in technology and entrepreneurship (GoZ, 2018), a challenge mirrored in other African nations like Nigeria (Okeke, 2022). Globally, the International Labour Organisation (ILO, 2019, highlights how inadequate mentorship and networks hinder career progression, amplifying the need for leadership training to bolster institutional support.

ECONOMIC BARRIERS

Economic constraints such as limited access to funding, persistent wage gaps and resources for business and innovation, undermine women's entrepreneurial ventures and independence (AFDB, 2019; World Bank, 2020). This mirrors the international findings, where women in developing economies face similar resource disparities (UNDP, 2021),

emphasizing the intersection of economic empowerment and technologic adoption as critical for progress. While studies highlight barriers to women's participation in industry, scant research explores how Zimbabwe's Education 5.0 model can systematically dismantle these obstacles in Zimbabwe, particularly through technology driven solutions and leadership development.

EDUCATION 5.0 AS A SOLUTION TO GENDER DISPARITIES

Education 5.0 offers a promising framework to address gender inequities by fostering industry relevant skills, challenging stereotypes, and promoting innovation. Its focus on practical education positions women as pivotal contributors to Zimbabwe's industrial landscape, aligning with broader African and global trends.

ENHANCING WOMEN'S ACCESS TO INDUSTRY-RELEVANT SKILLS

Gender-sensitive curricula and STEM-focused programmes can create inclusive learning environments, equipping women with technical expertise (Adebayo, 2020; UNESCO, 2020). In South Africa, similar initiatives have increased women's technology adoption in engineering fields (SAICE, 2022), while globally, countries like Finland showcase how targeted education enhances female participation in tech industries (OECD, 2019).

CHALLENGING GENDER STEREOTYPES

Mentorship programmes and networking opportunities, bolstered by leadership training, empower women to break into traditionally male-dominated industries (ILO, 2019). UN Women (2020) advocates for awareness campaigns to shift societal attitudes, a strategy effective in Rwanda, where policy-backed training has elevated women's leadership roles (Rwanda Gender Monitoring Office, 2021). Internationally, Canada's tech mentorship programmes illustrate scalable models for stereotype disruption (Tech Nation, 2020).

FACILITATING WOMEN'S ENTREPRENEURSHIP AND INNOVATION

Business incubation hubs provide training and resources for female entrepreneurs (AFDB, 2019), where technology-driven education enables women to acquire skills through online platforms, increasing accessibility (World Bank, 2020). Technology adoption via e-learning has revolutionised access in Kenya (Kenya Education Network, 2022), while globally, platforms like India's Digital India initiative, demonstrate how digital tools empower female innovators (NITI Aayog, 2021).

Research Gap: While Education 5.0 presents opportunities for women's empowerment, its long-term efficacy and scalability in Zimbabwe remain underexplored, particularly regarding technology integration and leadership outcomes.

POLICY INTEGRATION AND NATIONAL DEVELOPMENT STRATEGY

To fully realise the potential of Education 5.0, strong policy frameworks that embed gender-responsive strategies into Zimbabwe's national development agenda, drawing lessons from African and international policy experiences are required.

ALIGNING EDUCATION 5.0 WITH NATIONAL POLICIES

The National Gender Policy (NGP) (2022) mandates gender mainstreaming, aligning with Vision 2030's industrialisation goals. This mirrors Ethiopia's approach, where education policies prioritise gender equity to drive economic growth (MoE, Ethiopia, 2021). Internationally, Sweden's gender-integrated education policies offer a benchmark for policy impact (Swedish Government, 2020).

ROLE OF KEY STAKEHOLDERS

Government must enhance infrastructure and regulatory frameworks to support Education 5.0 (GoZ, 2018), while private-sector partnerships with universities can tailor training to industry needs (AFDB, 2019).

Civil Society's advocacy, as seen in Uganda's gender-focused education reforms (UNESCO, 2020), complements global efforts like the UN's HeForShe campaign, amplifying stakeholder collaboration.

MONITORING AND EVALUATION

Continuous assessment of Education 5.0's gender outcomes is essential (World Bank, 2020). Nigeria's data-driven education monitoring (NBS, 2022) and the UK's longitudinal STEM studies (UKRI, 2021) highlight the value of empirical tracking for policy refinement. Literature emphasizes Education 5.0's theoretical promise, yet policy-oriented studies on its integration and measurable impacts in Zimbabwe are lacking.

Existing research shows the multifaceted barriers to women's participation in industry and technology, necessitating the need for innovative educational solutions. Education 5.0 emerges as a catalyst for empowerment leveraging technology adoption, leadership training, and policy impact to bridge gender gaps, opportunity to equip women with relevant skills, challenge gender norms, and promote entrepreneurship. However, empirical evidence on its effectiveness, scalability and policy integration remains. Addressing these gaps is vital to ensuring that Education 5.0 becomes a sustainable driver of women's empowerment and national industrialisation in Zimbabwe.

METHODOLOGY

RESEARCH DESIGN AND APPROACH

This study adopts a mixed-methods approach, integrating qualitative and quantitative techniques to provide a comprehensive analysis of how Education 5.0 empowers women and fosters their participation in industrial development in Zimbabwe.

- *Quantitative research* (structured surveys of 100 female students and 15 faculty members).
- *Qualitative research* (interviews, case studies and focus group discussions).

The mixed-methods design allows for a deeper exploration of both statistical trends and personal experiences, ensuring a well-rounded understanding of the subject. It also allows for a comprehensive assessment of Education 5.0's impact on women's empowerment, focussing on universities adopting this model.

DATA COLLECTION METHODS

To ensure a robust analysis, the study utilises multiple data collection techniques:

DOCUMENT ANALYSIS

A review of policy documents, institutional strategic plans, and government reports (e.g., Zimbabwe's National Education Policy, SDG 5 frameworks) was conducted to understand policy alignment. The analysis assesses how Education 5.0 aligns with gender equality principles and national development strategies.

SURVEYS (QUANTITATIVE)

Structured surveys were administered to 100 female students and 15 faculty members across different disciplines.

- Surveys assess access to resources, skill acquisition, career pathways, and perceptions of gender inclusivity in industry.
- Convenience sampling is used to ensure a diverse range of participants actively engaged in Education 5.0.

INTERVIEWS (QUALITATIVE)

- Semi-structured interviews were conducted with 10 key stakeholders, including university administrators, policymakers, and industry leaders.
- These interviews provide insights into Education 5.0's implementation, challenges, and its impact on gender equality.
- Purposive sampling was applied to select individuals with direct experience in Education 5.0.

CASE STUDIES

A case study design is employed, focusing on Zimbabwean universities implementing Education 5.0. This design enables an in-depth examination of how Education 5.0 is institutionalised, its effectiveness in promoting gender equality, and its broader implications for industrial development.

- Success stories of women graduates who have applied Education 5.0 skills in industry or entrepreneurship are documented.
- These case studies illustrate real-world applications of the model in overcoming gender barriers and driving industrial development.

FOCUS GROUP DISCUSSIONS

- FGDs (FGDs) were conducted with 6-8 female students per group, targeting those in STEM, business, and technology fields.
- Discussions explore career trajectories, gender-related challenges, and perceptions of Education 5.0's impact on their opportunities.

SAMPLING STRATEGY

A purposive sampling approach ensures the inclusion of participants with direct engagement in Education 5.0. The study targets:

- 10 female students in industrial and technology-related courses.
- 2 faculty members involved in Education 5.0 curricula.
- 2 policymakers from the Ministry of Higher and Tertiary Education.
- 4 industry leaders from key sectors (technology, manufacturing, agriculture).

DATA ANALYSIS

QUANTITATIVE ANALYSIS

- Descriptive statistics summarise survey responses, identifying patterns in skills acquisition, resource access, and career outcomes.
- Correlation analysis assess relationships between education, entrepreneurship, and women's economic empowerment.

QUALITATIVE ANALYSIS

- Data from interviews, FGDs, and case studies were analyzed thematically, identifying key patterns such as gender barriers, institutional support, and industrial impact.
- A coding framework was applied to categorise responses and interpret findings within Zimbabwe's socio-economic landscape.

ETHICAL CONSIDERATIONS

- Informed consent was obtained from all participants, ensuring voluntary participation.

- Confidentiality and anonymity was maintained to protect sensitive information.
- Ethical approval was sought in alignment with university and research ethics guidelines.

LIMITATIONS

- *Generalisability*: Findings may be limited to Zimbabwean universities and may not fully apply to other institutions or sectors.
- *Self-reported Data*: Surveys and interviews rely on participants' perceptions, which may introduce bias. However, triangulation through multiple data sources enhances validity.

RESULTS AND DISCUSSIONS

This section presents the key findings from the data collection process and provides a comprehensive summary on how the results contribute to understanding the impact of Education 5.0 on women's empowerment and industrial development in Zimbabwe. The analysis integrates quantitative data from surveys, qualitative insights from interviews, focus group discussions (FGDs), and detailed case studies of women who have benefitted from Education 5.0. The results are framed within the context of national industrialisation goals and gender equality.

SURVEY FINDINGS

A total of 10 female students from the Women's University in Africa participated in the survey, representing various disciplines such as technology, engineering, business, and social sciences. The survey was designed to assess the extent to which Education 5.0 has equipped them with skills relevant to industrialisation and entrepreneurship and to capture their perceptions of the model's effectiveness in promoting gender equality.

1. ACCESS TO RESOURCES AND OPPORTUNITIES

- ☐ 60% of respondents reported increased access to resources, particularly in innovation and technology.
- ☐ Students noted that incorporating indigenous knowledge systems enhanced their understanding of industry-specific challenges and solutions.

2. GENDER EQUALITY IN EDUCATION

- ☐ 40% of respondents felt Education 5.0 helped them challenge traditional gender roles, yet resistance persists.
- ☐ 60% still experienced resistance from families and employers.

3. SKILLS ACQUISITION AND EMPLOYMENT PROSPECTS

- ☐ 70% of women reported gaining industrial and entrepreneurial skills that improved their employability.
- ☐ 40% expressed interest in starting businesses, particularly in STEM fields.

INTERVIEW FINDINGS

Interviews with university administrators, policymakers, and industry leaders (8 participants) provided insights into institutional and policy-level impacts of the educational model on women's empowerment and national development.

1. INSTITUTIONAL COMMITMENT TO GENDER EQUALITY

- ☐ Universities have integrated gender-sensitive curricula and innovation hubs to foster female entrepreneurship, though rural access remains a challenge.
- ☐ Challenges remain in ensuring equal access to resources, especially for rural students.

2. GOVERNMENT AND POLICY SUPPORT

- ☐ Education 5.0 aligns with national policies like the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (Zim-Asset) and the National Industrial Development Policy.
- ☐ Policymakers emphasise the need for stronger grassroots implementation to improve women's participation in Science, Technology, Engineering and Mathematics fields (STEM).

3. INDUSTRY COLLABORATION

- ☐ Industry leaders acknowledged women's growing role in innovation, particularly in Agri-tech and clean energy.
- ☐ Gender bias in hiring and limited mentorship opportunities remain challenges, especially for women in leadership roles.

FOCUS GROUP DISCUSSION FINDINGS

FGDs with female students and graduates provided further qualitative insights.

1. GENDER BIAS AND CULTURAL BARRIERS

- ☐ Many participants still faced resistance from family and employers, discouraging their industrial participation.
- ☐ Cultural expectations continue to influence career choices.

2. EMPOWERMENT THROUGH INDIGENOUS KNOWLEDGE

- ☐ 60% found the integration of indigenous knowledge empowering, particularly in agriculture, renewable energy, and sustainable development. (They cited how this cultural grounding helped them to better understand the economic and environmental needs of their communities).
- ☐ Some called for a better balance between traditional practices and modern scientific approaches.

3. IMPACT ON ENTREPRENEURSHIP

- Over 50% were actively involved in entrepreneurial ventures, particularly in agri-business, technology, and fashion. They credited Education 5.0's focus on practical, hands-on learning and problem solving with providing the tools necessary to manage their ventures effectively.
- Many sought mentorship programs and networking opportunities to expand their businesses.

DISCUSSION

The findings suggest that Education 5.0 is making notable progress in empowering women by equipping them with skills relevant to industrial development. The integration of gender-responsive curricula, hands-on training, and indigenous knowledge systems has provided a solid foundation for women's participation in various sectors.

However, several challenges persist:

- *Cultural and Social Barriers:* While Education 5.0 promotes gender inclusivity, deep-rooted cultural norms continue to limit women's full participation in industrial sectors.
- *Workplace Gender Bias:* Despite acquiring relevant skills, women still face hiring biases and limited leadership opportunities in industries.
- *Entrepreneurial Support Gaps:* Women-led start-ups require more mentorship, funding, and networking opportunities to thrive.

POLICY AND INSTITUTIONAL IMPLICATIONS

- *Enhanced Implementation:* Strengthening the practical implementation of gender-inclusive policies is necessary, particularly in rural communities.

- *Stronger Industry Partnerships:* Collaboration between universities and industry should address workplace gender bias and expand mentorship initiatives.
- *Scaling Education 5.0:* The model should be adapted to address local gender disparities in key industrial sectors.

Overall, while Education 5.0 has created new opportunities for women, structural and cultural barriers must be addressed to maximise its impact on industrial development and gender equality in Zimbabwe.

This section also highlights that collaboration between educational institutions, industry, and government is critical in creating a conducive environment for women to thrive. This study suggests that Education 5.0 should be scaled and adapted to address local contexts with a focus on reducing gender disparities in industries vital to Zimbabwe's economic future.

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

The transition from theoretical exploration to empirical evidence in the study reveals the transformative potential of Education 5.0 as a catalyst for women's empowerment and industrial development in Zimbabwe. By prioritising practical skills, entrepreneurial training, and innovation, Education 5.0 has begun to equip women with the tools necessary to transcend traditional gender roles and contribute meaningfully to national industrialisation. The integration of indigenous knowledge systems with modern educational practices has proven particularly effective, enabling women to devise contextually relevant solutions in fields such as technology, engineering, and agriculture. These advancements signal a shift toward a more inclusive educational paradigm that aligns with Zimbabwe's Vision 2030 and

global frameworks like SDG 5 (Gender Equality) and SDG 9 (Industry, Innovation, and Infrastructure).

However, while significant strides have been made in integrating gender equality into the educational framework, the journey toward gender parity remains in education and industry remains incomplete. Persistent challenges, including gender bias in employment, cultural barriers limiting women's participation in industrial sectors, and inadequate mentorship opportunities, underscore the gap between policy intent and grassroots reality. While Zimbabwean national frameworks like Zimbabwe Agenda for Sustainable Socio-Economic Transformation (Zim-Asset), advocate for gender equality, their implementation often falters at the local level, limiting women's access to transformative opportunities. The study's findings affirm that while Education 5.0's is a pivotal step forward, there is need for targeted interventions to strengthen women's access to education, industrial opportunities, and leadership roles in Zimbabwe's economic transformation.

Ultimately, the successful implementation of Education 5.0 has the potential to not only empower women, but also contribute significantly to Zimbabwe's industrialisation goals. By fostering an environment where women can have equal access to education, resources, and opportunities, Zimbabwe can create a more inclusive, sustainable, and innovative economy, one in which women are key drivers of national progress.

As the evidence suggests, Education 5.0 represents a pivotal moment for women in Zimbabwe, providing a platform for them to become key contributors to both national development and global progress, provided that concentrated efforts are made to scale and refine its application. The path ahead requires a synergy of policy, practice and societal need for continued investment in gender-sensitive education,

entrepreneurship, and industrial collaboration to ensure that women's roles in Zimbabwe's industrial future are both recognised and maximised.

RECOMMENDATIONS

The following recommendations are based on the findings and discussions presented in this study, and are made to strengthen the impact of Education 5.0 on women's empowerment and industrial development in Zimbabwe.

1. ENHANCE GENDER-SENSITIVE POLICIES IN EDUCATION

Finding Link: The study notes that while gender inclusivity in education has improved, cultural and structural barriers still hinder women's full participation in industrial fields.

Recommendation: Zimbabwean universities, including ZEGU, should develop more gender-responsive policies that promote the enrolment and retention of women in STEM fields through legislative mandates. This includes scholarships, mentorship programmes, and outreach initiatives for women, particularly in rural areas. A proposed Gender Equity in Higher Education Act could require all tertiary institutions to allocate at least 30% of STEM scholarships to women and establish gender equity offices to monitor enrolment and retention. Additionally, pilot programmes in rural districts, such as a 'STEM for Rural Women Initiative,' could target 500 female students annually with tailored training and subsidies to bridge urban-rural disparities.

2. INCREASE MENTORSHIP AND NETWORKING OPPORTUNITIES FOR WOMEN

Finding Link: A key challenge identified in the study is the lack of mentorship and networking platforms for women entering industrial sectors.

Recommendation: Universities should establish structured mentorship programmes in collaboration with the Ministry of Higher and Tertiary

Education, Innovation, Science and Technology Development to launch an initiative where female students and graduates are paired with successful women in industry: developing ‘a National Women in Industry Mentorship Programme’, pairing 1 000 female students and graduates with industry leaders annually. Additionally, mandatory industry networking events biannually, requiring at least 40% female representation among attendees, should be organised to connect women with potential employers, investors, and entrepreneurial partners.

3. PROMOTE THE INTEGRATION OF INDIGENOUS KNOWLEDGE AND MODERN TECHNOLOGIES

Finding Link: The study highlights the importance of indigenous knowledge systems in shaping practical solutions for industrial development, yet it also finds that this approach needs better integration with modern science.

Recommendation: Universities should collaborate with industry and local communities to develop a Hybrid Innovation Curriculum Pilot that combines traditional practices (e.g., sustainable agriculture) with modern technological advancements (e.g., precision farming), fostering innovation that is both culturally and industrially relevant. This could be supported by a legislative amendment to the Educational Act, mandating a 20% curriculum component on indigenous-modern synthesis. Industry partnerships with local cooperatives could test 50 student-led projects annually, ensuring practical application and scalability.

4. STRENGTHEN GOVERNMENT SUPPORT FOR WOMEN IN INDUSTRIAL SECTORS

Finding Link: Despite policy frameworks supporting gender equality, the study establishes that implementation at the grassroots level remains weak, particularly in industrial employment.

Recommendation: Enact a Women in Industry Incentive Policy, offering tax credits (e.g., 15% reduction) to companies employing at least 25% women in technical roles and grants of up to US\$10 000 for women-led start-ups. A pilot programme, 'Women Industrial Pioneers', could target 200 female entrepreneurs in key sectors like manufacturing and Agri-tech over three years, with impact evaluations informing nationwide rollout.

5. ENCOURAGE COLLABORATION BETWEEN UNIVERSITIES AND INTERNATIONAL PARTNERS

Finding Link: The study observes that access to global best practices and resources is limited, which affects women's competitiveness in industrial fields.

Recommendation: Zimbabwean universities should actively pursue partnerships with international organisations and educational institutions that specialise in gender equality and industrial development (e.g., UNESCO or African Union partners). These collaborations can provide knowledge exchange, funding, and access to advanced technologies. A legislative framework could incentivise these partnerships with tax exemptions for collaborating entities, ensuring sustained knowledge transfer and technological access.

6. EMPLOY DIGITAL MEDIA FOR WOMEN'S EMPOWERMENT AND VISIBILITY

Finding Link: The study takes note that cultural perceptions and lack of representation in mainstream media contribute to barriers in women's empowerment and participation in industrial sectors.

Recommendation: Social media and digital platforms like X and YouTube should be leveraged to create visibility for women in industrial fields. Universities and industry leaders, in partnership with the Ministry of Information, could fund and promote success stories, create educational content on women in technology and entrepreneurship, and use digital platforms for mentorship and

networking. This, in turn, would work towards enhancing public awareness and support.

POLICY IMPLEMENTATION PLAN

To ensure the successful implementation of these recommendations, a phased approach is proposed:

Short-term (2025-2027)

- Conduct a national gender and skills gap assessment by mid-2025, followed by drafting the Gender Equity in Higher Education Act and launching pilot programmes (e.g., STEM for Rural Women Initiative) by 2026.

Medium-term (2027-2032)

- Invest in infrastructure and technology to support women's education and entrepreneurship (e.g., innovation labs) by 2028. Implement the Women in Industry Incentive Policy by 2029, and evaluate pilot outcomes to refine strategies by 2031.

Long-term (2032-2040)

- Fully integrate Education 5.0 into Zimbabwe's national development strategy. Expand Education 5.0 initiatives to rural and marginalised communities. Establish Zimbabwe as a regional hub for gender-inclusive education by 2040.

EXPECTED OUTCOMES

1. Increased participation of women in industrial and technological sectors.
2. Improved entrepreneurship and innovation among women.

3. Enhanced economic growth and national development through women's contributions to industrialisation by 2040.

POTENTIAL CHALLENGES AND MITIGATION STRATEGIES

Challenge: Cultural barriers limiting women's participation in industrial fields.

Mitigation: Community awareness campaigns and policy enforcement to support gender equality in employment and education.

Challenge: Persistent gender bias in hiring and promotion in industrial sectors.

Mitigation: Mandate gender audits in industries receiving incentives, with penalties for non-compliance by 2028

Challenge: Funding constraints for women's initiatives.

Mitigation: Establishment of government and private-sector grants targeting women entrepreneurs.

Challenge: Lack of adequate representation of women in policy-making and industrial leadership.

Mitigation: Propose a 2029 amendment to the Public Entities Corporate Governance Act, requiring 40% female representation on industrial boards.

CONCLUSION

Education 5.0 has made commendable progress in promoting women's empowerment and industrial development in Zimbabwe. However, for it to be truly transformative, continued effort is needed to address cultural, economic, and policy barriers that limit women's full participation. By implementing the above recommendations, Zimbabwe can create an inclusive, innovative, and industrially competitive education system that ensures gender equality and sustainable national development.

REFERENCES

- Adebayo, O. (2020). Education 5.0: A New Paradigm for Heritage-Based innovation. *Journal of Education and Human Development*, 9(1), 1-12.
- African Development Bank (2019). African Development Report 2019.
- African Development Bank (2020). Empowering Women in African Industrialization. African Development Bank Group.
- African Union (2021). Agenda 2063: The Africa We Want—Gender Equality and Women’s Empowerment. African Union Commission.
- Chirimuuta, C. (2021). The Role of indigenous Knowledge in Sustainable Development: Lessons for Zimbabwe. *Sustainability in Development Journal*, 5(1), 33-48.
- Food and Agriculture Organisation. (2022). Women and Agriculture: Driving Sustainability in Zimbabwe.
- Government of Zimbabwe (2021). National Gender Policy of Zimbabwe Advancing Equality and Equity in Development.
- Government of Zimbabwe (1999). The Nziramasanga Commission. Report of the Presidential Commission of inquiry into Education and Training.
- Government of Zimbabwe. (2018). Zimbabwe’s Vision 2030.
- International Labour Organisation. (2019). Women in Business and Management: The Case for Gender Diversity.
- Kabeer, N. (2010). Women’s Empowerment and Economic Development. *Journal of International Development*, 22(5), 665-676.
- Kenya Education Network (2022). Expanding Access: The Role of E-Learning in Kenyan Higher Education. KENET Annual Report.
- Luckin, R. (2018). Machine Learning and Human intelligence: The Future of Education for the 21st Century. London: UCL IOE Press.

- Makuvaza, N. and Gatsi, T. (2023). Transforming Education through innovation: A Zimbabwean Perspective. *Educational Reforms Quarterly*, 8(2), 198-212.
- Malhotra, A. and Schuler, S. R. (2005). Women's Empowerment as a Variable in International Development: Measurement and Interpretation. *Gender and Development*, 13(1), 5-19.
- Mawere, M. (2020). Education, Gender, and Development: A Focus on Zimbabwe's Higher Education System. *African Higher Education Journal*, 15(1), 102-118.
- Ministry of Education, Ethiopia (2021). Education Sector Development Programme VI: Gender Equity in Ethiopian Education. .
- Ministry of Higher and Tertiary Education, Science, and Technology Development (2022). National Higher Education Policy for inclusive Development. Government of Zimbabwe.
- National Bureau of Statistics, Nigeria. (2022). Education Statistics Report 2022: Monitoring Progress in Nigeria.
- NITI Aayog. (2021). Digital India: Empowering Women through Technology. New Delhi: Government of India
- .Okeke, N. (2022). Policy Gaps and Women's Advancements in Nigerian Technological Sectors. *Journal of African Development Studies*, 14(2), 45-60.
- Organisation for Economic Co-Operation and Development (2019). Gender Equality in Education, Employment and Entrepreneurship: Final Report.
- Rwanda Gender Monitoring Office (2021). Gender Equality in Leadership: Progress and Challenge in Rwanda. Annual Gender Report.
- Schultz, T. W. (1961). Investment in Human Capital. *American Economic Review*, 51(1), 1-17.
- South African institution of Civil Engineering (2022). Women in Engineering: Trends and Opportunities in South Africa. SAICE Report.

- Swedish Government. (2020). Gender Mainstreaming in Education: A Policy Framework. Ministry of Education and Research.
- TechNation (2020). Breaking Barriers: Mentorship Programs for Women in Canadian Tech. TechNation Annual Report.
- UK Research and innovation (2021). STEM Education and Gender: A Longitudinal Study.
- United Nations Development Programme (2021). STEM Education and Gender: Gender and Economic Empowerment in Developing Economies.
- United Nations Development Programme. (2023). Sustainable Development Goals: Progress Report on Gender Equality.
- United Nations Educational, Scientific and Cultural Organisation. (2019). Heritage-Based Education: A Tool for Sustainable Development.
- United Nations Educational, Scientific and Cultural Organisation. (2020). Education 5.0: A Framework for the Future.
- World Bank (2020). World Development Report 2020: Global Value Chains and the Future of Work.
- World Bank (2021). Empowering Women through Education: Lessons from Africa. World Bank Publication.