TRANSFORMING EDUCATION AND HUMAN CAPITAL DEVELOPMENT IN ZIMBABWE: A LEADERSHIP-DRIVEN APPROACH LEVERAGING EMERGING TECHNOLOGIES IN HIGHER EDUCATION

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Abstract

Zimbabwe experiences serious challenges in education and human capital development, which hinder its economic and social advancement. This paper explores the transformative potential of a leadership-driven approach, integrated with emerging technologies such as artificial intelligence (AI) and online platforms, to enhance educational outcomes within Zimbabwean Higher Education Institutions (HEIs). Employing a quantitative case study design, quantitative data were collected through a structured survey administered to a representative sample of 200 educational leaders, assessing their perceptions of leadership and technology's impact on education. The quantitative analysis was conducted using descriptive and inferential statistics via SPSS, version 20. Underpinned by a multi-faceted theoretical framework, including Human Capital Theory, Transformational Leadership Theory, and the Technology Adoption Model (TAM), the findings reveal the crucial role of leadership and technological innovation in fostering educational transformation and enhancing graduate employability. The paper acknowledges limitations and explores theoretical and practical implications, proposing a leadership paradigm that emphasises innovation, inclusivity, and adaptability. Recommendations for educators and policymakers centered on leveraging transformative leadership and emerging technologies to promote sustainable human capital development in Zimbabwe and beyond.

Keywords: Transformational Leadership, Human Capital Development, Technology Adoption Model, Emerging Technologies, Higher Education Institutions, Zimbabwe

Introduction

The need for a highly educated and agile pool of talent is critical in an age of dramatic technological change and growing global interdependence (Melnyk et al., 2021). Higher Education Institutions (HEIs) play a pivotal role in the development of such a workforce by instilling in graduates' skills like critical thinking, adaptability, and digital literacy (Kalyani, 2024). The implication is that (HEIs) should adopt and effectively implement the new technologies including artificial intelligence (AI) and other educational mobile technologies to advance the goals of Education 5.0 model advocating for acceleration of digitalisation of their operations and curricula as articulated by Nherera and Mukora (2024). Yet, a number of HEIs, notably in developing nations, like Zimbabwe, undergo significant challenges limiting their capacity to responsibly address these demands. The scholars found that HEIs in Zimbabwe had adopted externally developed digitalisation frameworks without effectively adapting them to local contexts. The challenges range from a lack of updated curricula to limited resources and insufficient technological integration across the university curriculum (Nherera & Mukora, 2024). This is contrary the requirements of Agenda 2030 Sustainable Development Goals 4 and 5 which call for quality education and inclusivity coupled with gender parity particularly achieved through the application of emerging technologies that encompass artificial intelligence(AI), big data analytics, virtual reality(VR), internet of things(IoT) and others. Other international studies recommended that educational institutions should use emerging technologies to school humans as

a form of capital in order to promote socio-economic development (Moghtader, 2021).

These emerging technologies (ET) are evolving electronic and digital tools which are expected to

substantially alter the educational systems, businesses and social contexts including higher educational institutions (HEIs) such as universities. This scenario suggests that a human capital development model with synergistic collaboration efforts on emerging technology has the potential to resolve these issues, which would subsequently contribute positively to the change process of education and human capital formation in HEIs within Zimbabwe. Human Capital Development (HCD) entails the enhancement of individuals' skills, knowledge, competencies, and attributes to enable their effective participation in the economy and contribution to national development (Lee & Han, 2021; World Bank, 2021). This encompasses investment in education, aligning educational policy to practice (Salimi, 2025) adhering to the World Bank's approach to EdTech in Sub-Saharan Africa although different studies show that diffusion of new technologies remains challenging and its success depends on the leadership perspectives of educational leaders (Kalyani, Bloom, Carvalho, Hassan, Lerner, & Tahoun, 2024).

Based on this understanding, this study explores the impact of transformational leadership practices on technology adoption and its subsequent effects on human capital development. There is need to understand key issues and concepts concerning transformative education and human capital development, training, and other forms of human capacity building. This research focuses on Artificial Intelligence (AI) and online platforms, including their applications in education for data mining, personalised learning, enhanced communication, and increased accessibility (Baker, 2010; Russell, & Norvig, 2016). through the lens of technology leadership perspectives such as transformational leadership. (Guan, Mou, & Jiang, 2020).

Transformational leadership (TL) style is characterised by inspiring and intellectually stimulating followers, fostering innovation, and promoting positive change (Bass, 1985) to improve the standards of learning across the curriculum. In HEIs, this involves creating a culture of innovation and encouraging faculty to embrace new technologies and pedagogies enabling the development of the 21st century skills and human capital.

However, Zimbabwe's higher education institutions are having a crisis of relevance as they struggle to generate graduates with the competencies and abilities that the workforce of the twenty-first century requires (Chirisa, 2024; Nherera & Mukora, 2024). Low completion rates, out-of-date curricula, and inadequate technological integration are examples of this. Zimbabwe's social advancement and economic growth are being hampered by the inadequate development of human capital. In order to promote graduate employability and human capital development, the main issue this study attempts to solve is the lack of a clear knowledge of how leadership can propel the successful integration of emerging technologies in Zimbabwean HEIs.

Research Gap

Although the literature currently in publication recognizes the difficulties Zimbabwean HEIs face and the potential of technology to revolutionize education, there is still a great deal to learn about the precise role that leadership plays in promoting technology adoption and its subsequent effects on the development of human capital in this setting. Prior research has frequently concentrated on the possible advantages of particular technologies (Mafa & Chigwedere, 2025) or the obstacles to technology integration (Maringe & Sing, 2014; Nwogbo, 2017). To further explain this issues, Maringe & Sing (2014) argued that teaching large classes in an increasingly internationalising higher education environment requires careful consideration of pedagogical, quality and equity issues as specified under the SDGs 4 and 5. However, there is a dearth of research that thoroughly examines how leadership styles, technology uptake, and human capital outcomes interact in Zimbabwean higher education institutions.

This study aims to close a critical gap in the literature by studying how leadership practices can create a supportive environment for technology integration, thereby enhancing graduate employability. In order to achieve this goal, the study addresses the following key question: *How can leadership facilitate the effective integration of emerging technologies in Zimbabwean HEIs to enhance human capital development*? It also explores the potential of a leadership-driven approach, in conjunction with emerging technologies, to transform education and human capital development within Zimbabwean Higher Education Institutions (HEIs) guided by the following three specific research objectives.

- 1. To determine the impact of transformational leadership practices on faculty perceptions regarding the usefulness of emerging technologies in education.
- 2. To assess how the perceived ease of use of emerging technologies influences the relationship between transformational leadership and faculty perceptions of technology's usefulness.
- 3. To evaluate the contributions of current educational practices that leverage technology to human capital development in Zimbabwean HEIs, with the goal of developing a technology-leadershipcentric model for transformative education.

In order to give policymakers, educational leaders, and faculty useful insights, this research attempts to achieve these goals and offer a thorough understanding of how leadership and technology interact to alter education and human capital development in Zimbabwe.

Contextual Background

Reaching Sustainable Development Goal 4 and 5(SDG 4&5)—Quality Education and Gender Equity remains a major obstacle throughout Africa, especially in HEIs (UNESCO, 2021). SDG 4 and 5 seeks to guarantee inclusive, equitable, high-quality education and encourage opportunities for lifelong learning for everyone without any gender discrimination and/or biases. Low primary and secondary school completion rates and restricted access to higher education are two urgent issues that Zimbabwe must deal with in order to move closer to reaching SDG 4 and 5 targets (GN et al., 2024). Less than one-third of young people in Sub-Saharan Africa complete upper secondary school, making it the region with the lowest primary completion rates in the world, according to the UNESCO Institute for Statistics, & United Nations Children's Fund (2022). This low level of education results in a shortage of human capital, which impedes the continent's economic progress.

According to a World Bank brief on Zimbabwe, a child born in Zimbabwe will only be 47% as productive as they could be if they had access to full health care and quality education accessed to all without any form of discrimination (World Bank,2021). Despite having a strong history, Zimbabwe's higher education system has been underfunded and has endured years of economic difficulty (Maringe & Sing, 2014). These issues are made worse by inadequate infrastructure and finance, which make it harder for institutions to incorporate the required technologies (Nwogbo, 2017). Learning results at HEIs are still low, despite Zimbabwe having achieved gender parity in elementary education. This calls for a transformative approach to education (Schneegans, 2021).

Additionally, in the context of Zimbabwe, GN et al. (2024) draw attention to obstacles to inclusion, success, equity, and access in higher education. These difficulties highlight how urgently creative solutions that make use of available resources and advance sustainable development are needed (Sandoval-Hernández, Isac, Carrasco, & Miranda, 2021; UNICEF. 2021; World Bank, 2021).

The necessity of a transformative strategy It is essential to investigate creative, situation-specific solutions that make use of technology and leadership in light of the difficulties Zimbabwean HEIs face. According to research, new technologies like artificial intelligence (AI) and online platforms have the potential to help students get ready for the workforce of the twenty-first century (Kayyali, 2024; Li et al., 2024). For example, internet platforms can improve educational accessibility and facilitate collaboration, while AI systems can personalize learning experiences (Baker, 2010; Russell & Norvig, 2009).

It has been demonstrated that incorporating AI into educational settings improves student engagement through customized feedback (Madhumithaa et al., 2025) and individualized learning pathways (Ekuma, 2024). These developments highlight the need for strong leadership in HEIs to promote an innovative and adaptable culture. With digital technologies that facilitate collaboration and streamline administrative procedures, technology's role in improving educational leadership is also growing in significance (Indoria et al., 2024). Additionally, a crucial ability for educators to successfully use AI is rapid engineering, a method for optimizing AI outputs (Cain, 2024). However, in order to overcome opposition to change and guarantee fair access for all students, the successful integration of new technologies necessitates a supportive institutional culture and strong leadership.

Therefore, this study addresses a critical gap in the literature by examining the interplay between leadership, technology adoption, and human capital development in Zimbabwean HEIs. By providing empirical evidence and actionable insights, it contributes to the transformation of higher education in Zimbabwe and equips graduates with the skills needed to thrive in a rapidly changing world.

The Integrated Theoretical Framework: Guiding Transformative Education in Zimbabwe

This research examined how transformational leadership styles influence faculty perceptions of technology usefulness and ease of use, as well as their willingness to integrate technology into their teaching practices. The research also investigated how leadership styles correlate with perceived quality education and graduate employability (Camps & Rodríguez, 2011). Its strength lies in its adoption of an integrated theoretical framework, combining Transformational Leadership Theory, Human Capital Development Theory, and the Technology Adoption Model (TAM).

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Source: Field Data

Transformational Leadership Theory 1. This multifaceted approach was applied to provide a robust lens through which to examine the complex dynamics technology, of leadership, and educational transformation within Zimbabwean Higher Education Institutions (HEIs). The integration theoretical framework to guide educational initiatives is also recommended by Samodien, Du Plessis, & Van Vuuren, (2024) specifically for enhancing higher education performance through employing merits from ttransformational, transactional, agile leadership and other models depending on the context.

Transformational Leadership Theory posits that effective leaders inspire and intellectually stimulate their followers, fostering innovation and positive change (Bas & Avolio,1994; Bass, 1985). It emphasizes the importance of vision, inspiration, and intellectual stimulation, which are vital for driving organizational change. It highlights the leader's role in empowering followers and fostering a shared sense of purpose. Richard & Simankane (2020) and Abbas, Hisham-Ul-Hassan, & Raza, (2024) concur that transformational leadership is effective in inspiring and developing staff to their full capacity resulting in achieving organisational change and development.

Kgari-Masondo, Chingwanangwana, Umejei, et al., (2024)'s findings that effective leadership can significantly improve educational outcomes by motivating educators to adopt innovative practices (Ghasabeh, Soosay, & Reaiche, 2015) are in line with transformational leadership's emerging role in driving organizational change; in Zimbabwean HEIs, where resource constraints and resistance to change may be prevalent, transformational leaders can play a pivotal

role in fostering a philosophy of adaptability and continuous improvement.

However, the paper acknowledges the limitations of this theory. It can be criticized for being overly focused on the leader's charisma and may overlook the importance of structural and contextual factors. It may also be difficult to measure and implement consistently. Such demerits can be augmented by other theories such as the human capital development and the technology acceptance model.

2. Human Capital Development Theory Capital Development Theory (Schultz, 1963)

The study investigated how integrating technology into HEI courses affects graduate employability and gets students ready for the workforce. It also looked at how effective leadership practices promote the development of human capital by creating an atmosphere that is conducive to the adoption of new technologies. UNICEF (2022), Goldin (2024), and Muzari (2023) all affirm the significance of human capital development for the advancement of a country suggesting the Integration Public Private Partnership Strategy (PPPS) for Ssustainable Students Skills Development (SSSD) in Technical and Vocational Education and TrainingTVET in Zimbabwe (Muzari,2023). This idea emphasizes the value of spending money on education and training to improve knowledge and skills, which are essential for both national development and economic prosperity. This theory offers a framework for understanding how HEIs may support the development of human capital through technology integration in Zimbabwe, where there is a need to close the skills gap and improve the employability of graduates.

The theory is difficult to use for measuring the direct impact of education on economic growth and it can be criticized for its focus on economic outcomes and may ignore the social and cultural dimensions of education. It also highlights the long-term benefits of investing in education and the connection between human capital and economic productivity (Mpofu, & Sebele-Mpofu, 2024). The comparative review of the incorporation of AI Technology in Accounting Education showed several merits associated with AI integration in the teaching and learning of accounting and related disciplines.

3. Technology Adoption Model (TAM)

An overview of the concepts, contribution, limitation, and adoption of the Technology Acceptance Model in education is provided by Zaineldeen et al (2020). The Technology Adoption Model suggests that perceived usefulness (PU) and perceived ease of use (PEU) significantly influence technology adoption (Davis, 1989; Davis et al., 1989).

Research by Zhang and Chen (2024) indicates that leadership practices significantly influence the adoption of digital tools in educational settings, further supporting the relevance of TAM in this study. This was confirmed in Taherdoost (2018)'s review of technology acceptance and adoption models and theories particularly for instructional purposes.

Literature Review

Challenges in Zimbabwean Higher Education

According to Maringe and Sing (2014), Zimbabwean HEIs have a number of difficulties, such as a lack of infrastructure, insufficient finance, and a misalignment between business demands and curriculum. According to Nherera and Mukora (2024), socioeconomic considerations exacerbate these difficulties and impede attempts to incorporate new technologies.

Due to budgetary limitations and scarce resources, the socioeconomic environment makes integrating new technology even more difficult (UNESCO, 2020). Additionally, Mufanechiya & Dube (2024) investigate the difficulties instructors in Zimbabwean higher education institutions encounter.

The Role of Leadership in Educational Transformation

International research shows that transformational leadership can create a change-friendly atmosphere. Good leaders can encourage teachers to use new teaching strategies and meaningfully use technology (Kgari-Masondo & Chingwanangwana, 2024). Support from leaders increases faculty motivation and student engagement, both of which are critical for successful technology adoption.

Chirisa (2024) also emphasizes the need for adaptive leadership in the changing higher education landscape in Zimbabwe. A study published in the Online Journal of Distance Learning Administration (2014) emphasizes the significance of leadership in integrating educational technology in higher education.

The Impact of Emerging Technologies

New technologies like artificial intelligence, virtual reality, and big data have the power to completely transform teaching methods in Zimbabwean higher education institutions. While VR produces immersive environments that increase engagement, AI enables personalized learning experiences (Stafford, 2016; Chigwedere et al., 2023). By detecting learning gaps, big data analytics can enhance student support services and guide instructional methods (Adeofe & Adedoyin, 2022). A supportive institutional culture and competent leadership are essential for successful integration.

The significance of incorporating technology into human resource management is emphasized by research by Alaghbari et al. (2024), which also suggests that similar ideas might be used in education to improve workforce development. This emphasizes the necessity of a comprehensive strategy that combines technology, human capital development, and leadership.

Methodology

In order to comprehensively examine leadership practices, technology adoption, and human capital development among Zimbabwean Higher Education Institutions (HEIs), this study adopts a quantitative method. 200 educational leaders chosen by stratified sampling—which random guarantees representativeness across a range of jobs such faculty deans, department heads, and coordinators-were given a self-designed structured questionnaire. of order to accommodate a large number of participants from various departments of a chosen HEI in Zimbabwe, the structured survey that was conducted online served as the main instrument for gathering data. The survey had multiple important areas and used a 5-point Likert scale (1 being strongly disagree and 5 being strongly agree).

• *Demographics:* Compiling fundamental data including faculty affiliation, age, gender, and institutional role. Assessing opinions on the attributes of leaders (e.g., "Leaders at my HEI inspire me to fulfill my full potential") is a component of transformational leadership.

• *Perceived Utility of Emerging Technologies*: Evaluating opinions of how Online Learning Tools and other technologies can enhance educational results (e.g., "The use of Virtual Reality can significantly increase student learning outcomes"). • *Perceived Ease of Use of Emerging Technologies*: "I am confident in my capacity to understand and use AI technology in my teaching" is an example of a measure of confidence in utilizing emerging technologies. Assessing how technology is incorporated into curricula (e.g., "Integrating technology into the curriculum prepares students for the labor market") is part of human capital development.

Data Analysis

Quantitative Analysis: IBM SPSS Statistics was used to analyze the survey data. Analysis of variance (ANOVA) was used to determine whether there were significant differences between variables, descriptive statistics (such as frequencies, means, and standard deviations) summarized the responses, and inferential statistics (correlation) investigated the relationships between transformational leadership and perceptions of emerging technologies (Mustafy & Rahman, 2024; Field, 2024).

Validity and Reliability

The intention was to improve the validity of quantitative data. The instrument was standardized in pilot research with 30 participants. Cronbach's Alpha was computed to evaluate reliability, and the result was

a high value of 0.967, indicating strong internal consistency (ADENIRAN, 2025; Robinson, 2024). Data collection was preceded by ethical approval from the appropriate institutional review boards. Informed consent was obtained from participants when they were made aware of the goal of the study. All data had personal identifiers eliminated in order to ensure confidentiality throughout the study. Participants received assurances that they would not be subject to any consequences if they choose to leave the study at any point (Torrance, Mormina, Sayeed, Kessel, Yoon, & Cislaghi, 2025).

In contrast to qualitative research, the study's use of a quantitative approach allows for the generalization of findings from a wider sample and attempts to offer a comprehensive understanding of how leadership practices might create a supportive climate for technology integration in Zimbabwean HEIs. The results offered insightful information to faculty, educational leaders, and legislators, which helped to improve educational outcomes and graduate employability in a world economy that is changing quickly (Vivek, & Krupskyi, 2024). For Zimbabwe to establish a technology-leadership-centric model for transformative education and human capital development, this research is essential for filling in gaps in the literature.

Results Demographic Profiles

Table 1 presents the demographic characteristics of the participants. Table 1: Demographic Profiles of Participants

Variable	Description	Frequency	Percent (%)		
Age	Below 40 years	33	16.5		
	40-50 years	70	35.0		
	51-60 years	95	47.5		
	Above 60 years	2	1.0		
Gender	Male	122	61.0		
	Female	78	39.0		
Highest	First Degree	4	2.0		
Qualification	-				
	Master's Degree	134	67.0		
	PhD	55	27.5		
	Other	7	3.5		
Experience with	Less than 5 years	13	6.5		
Technology					
	5-10 years	67	33.5		
	11-15 years	95	47.5		
	Above 15 years	25	12.5		
Role	Faculty Dean	21	10.5		
	Department Chairperson	58	29.0		
	Coordinator	121	60.5		
Faculty	Education	42	21.0		
	Law	35	17.5		
	Social Sciences	50	25.0		

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	Business Sciences	42	21.0
	Maths, Science & Technology	31	15.5
Total		200	100.0

The age distribution of the participants shows a mixed representation of seasoned professionals, with the majority of them lying between the 40 and 60 age range. According to the gender breakdown, there are more men (61%) than women (39%) among the participants. The sample is highly educated, as evidenced by the fact that most individuals have either a Master's degree (67%) or a PhD (27.5%). Coordinators make up the

majority of participation (60.5%), followed by department chairpersons (29%) and faculty deans (10.5%), suggesting that HEI leadership positions are represented in a variety of ways. Although participants' levels of technological experience vary, a sizable portion (47.5%) have between 11 and 15 years of experience.

Descriptive Statistics: Perceptions on Emerging Technologies

Table 2 presents the descriptive statistics for participants' perceptions on emerging technologies. Table 2: Descriptive Statistics for Perceptions on Emerging Technologies

Constructs	Minimum	Maximum	Mean	Std.	Skewness	Std.
				Deviation		Error
Emerging technologies would significantly improve student	1	5	3.84	0.712	-1.192	0.172
Integrating technology can make learning	1	5	3.01	0.684	_0.923	0.172
content more interactive.	1	5	5.71	0.004	-0.725	0.172
Technology can provide wider access to a	1	5	3.89	0.675	-1.255	0.172
variety of learning resources						
My HEI offers programmes to equip staff	1	5	3.90	0.675	-0.958	0.172
with digital literacy skills.						
Emerging technologies can significantly	1	5	3.87	0.672	-0.952	0.172
enhance the quality of education.						
Valid N (listwise)						

On a scale of 1 to 5, participants' mean scores range from 3.84 to 3.91, indicating that they generally have a positive perception of emerging technology. This suggests a positive attitude about the possible effects of technology on interactive learning materials, increased access to resources, student involvement, and educational quality. Interestingly, all of the items have a slight negative skewness, according to the skewness values, which suggests that most participants tend to rate the items higher on the scale. The mean score of 3.90 for the item measuring this characteristic indicates that most participants appreciate institutional support for staff training in digital literacy.

Relationships between Demographic Data and Other Variables

Numerous noteworthy connections between demographic information and other variables were found via correlation analysis: Age: Experience using technology and age have a weakly positive link (r = 0.191, p < 0.01). Gender: Female participants often had lesser qualifications, as evidenced by a substantial negative association between gender and the highest qualification (r = -0.221, р < 0.01). Highest *Qualification*: Participants with higher qualifications are less likely to have lower-level roles, according to a strong negative correlation found between the highest qualification and role (r = -0.649, p < 0.01). *Role*: There is a positive correlation between role and technology use experience (r = -0.180, p < 0.05), suggesting that those in higher roles have greater technological experience. Technology usage Experience: Age and technology usage experience have a favorable correlation (r =0.191, p

Correlation Analysis: Leadership Styles and Emerging Technologies

Table 3 presents the correlation coefficients between leadership styles, emerging technologies, and related constructs. Table 3: Correlation Coefficients between Leadership Styles and Emerging Technologies

Variables	Leadership Style Quality Education	Leveraging Leadership Innovation	Merit	Challenges
Leadership Style Quality	1	0.715**	0.586**	-0.192**
Education				
Leveraging Leadership	0.715**	1	0.549**	-0.280**
Innovation				
Merit	0.586**	0.549**	1	-0.045
Challenges	-0.192**	-0.280**	-0.045	1

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Note: ****** Correlation is significant at the 0.01 level (2-tailed).

Leveraging Leadership Innovation and Leadership Style Quality Education have a substantial positive association (r = 0.715, p < 0.01), suggesting that a high level of leveraging leadership innovation likely to be associated with a perceived high quality of leadership style. Furthermore, there is a somewhat significant association between Leadership Style Quality Education and Merit (r = 0.586, p < 0.01), indicating that leadership styles that are thought to support quality education are also linked to merit. obstacles and Leadership Style Quality Education have a weakly negative connection (r = -0.192, p < 0.01), suggesting that less perceived obstacles are linked to greater perceived leadership quality.

A higher level of leveraging leadership innovation is linked to perceived leadership quality and merit, as evidenced by the substantial positive correlations found between it and Leadership Style Quality Education (r = 0.715, p < 0.01) and Merit (r = 0.549, p < 0.01). Higher levels of leveraging leadership innovation are linked to less perceived obstacles, according to a slight negative correlation found between the two variables (r = -0.280, p < 0.01).

ANOVA Results: Leadership and Graduate Employability

Table 4 presents the ANOVA results for leadership and graduate employability.

Variables	Sum	of	df	Mean	F	Sig.
	Squares			Square		
1. Our HEI leadership achieve expected graduate attainment						
& employability.						
Between Groups	155.413		17	9.142	2495.755	.000
Within Groups	0.667		182	0.004		
Total	156.080		199			
36. My HEI contributes to graduate employability						
Between Groups	39.866		17	2.345	8.613	.000
Within Groups	49.554		182	0.272		
Total	89,420		199			

Participants' perceptions of leadership and the expected graduate attainment and employability in HEIs are strongly correlated, as indicated by the significant F-

Discussion of Key Findings

Although leaders recognized the potential of emerging technologies like artificial intelligence, virtual reality, and big data analytics, their widespread adoption was hampered by a lack of technical expertise and limited resources, according to the quantitative data analysis, which also found a positive correlation between transformational leadership styles and perceptions of improved education quality and human capital development (Sahoo et al., 2024; Singh, 2024).

Perceptions of Emerging Technologies

value (2495.755), which implies that participants believe leadership styles have a significant impact on the attainment of expected graduate outcomes and employability.

The findings of descriptive statistical analysis support the need for leaders to adopt a new paradigm of leadership that emphasizes creativity, inclusivity, and flexibility. Their answers demonstrated how crucial it is for HEIs, the government, and business to work together to create curricula that meet the demands of the labor market today and in the future (Kibona, 2024; Njifen, 2024).

On a scale of 1 to 5, participants' mean scores range from 3.84 to 3.91, indicating that they generally have a

positive perception of emerging technology. This suggests a positive attitude about the possible effects of technology on interactive learning materials, increased access to resources, student involvement, and

Institutional Support for Digital Literacy

The mean score of 3.90 for the item measuring this aspect indicates that most participants acknowledge institutional support for providing staff with digital

Leadership Styles and Quality Education

A leadership-driven model was proposed for technological and educational transformation in the studied context based on the findings of Day, Sammons, and Gorgen (2020), who emphasize the importance of successful school leadership in driving educational

A Proposed Leadership-Driven Model for Technological Transformation in Zimbabwean HEIs

The study's compelling model, shown in Figure 2, combines technology adoption, leadership, and human

educational quality. This is consistent with studies by Ahn & Shin (2018), who discovered that technology use and classroom atmosphere can have a good impact on self-directed learning.

literacy skills, indicating that HEIs in Zimbabwe are working to equip staff with the skills they need to successfully incorporate technology into their teaching practices (GN et al, 2024)

improvement. The strong positive correlation (0.715) between leadership styles and quality education suggests that leaders who leverage effective styles are perceived as promoting better educational outcomes (Vivek, & Krupskyi, 2024).

capital development (HCD) to revolutionize Zimbabwean HEIs. Through a thorough analysis of quantitative data from 200 educational leaders, the research identifies a crucial interaction between these factors, providing a clear path for HEIs to prosper in the global environment of the twenty-first century.



Source: Field Data.

A Proposed Leadership-Driven Model for Technological Transformation in Zimbabwean HEIs

The Model's Core Components:

The suggested framework as shown in Figure, is based on a leadership-driven strategy for integrating

Important Component of the Model:

The Engine of Transformational Leadership:

The study emphasizes how important it is for leaders to encourage, inspire, and enable their staff to welcome change. This entails developing an innovative culture, modeling the use of cutting-edge technologies, and technology. It asserts that successful technology adoption and, eventually, strong human capital development are fueled by effective leadership, especially transformational leadership. This approach aims to improve educational outcomes and graduate employability by strategically utilizing technology, not just introducing it.

developing a compelling vision for technological integration.

This clearly indicates that HEI leaders are visionaries who actively participate in training programs, promote digital literacy, and foster conditions that allow professors to try out new tools.

Strategic Technology Adoption: The model acknowledges the positive perceptions of emerging technologies (including AI, VR, and online platforms) and lays a significant emphasis on strategic adoption that is tailored to the particular needs of Zimbabwean HEIs. This means investing in a robust infrastructure (hardware, software, and a reliable internet), providing ongoing training in digital literacy, and establishing laws that promote technology use that is efficient and

Human Capital Development as the Outcome:

The model's ultimate goal is to enhance HCD, equipping graduates with the skills and competencies needed to thrive in a competitive global workforce. This entails incorporating technology into the curriculum, encouraging cooperation with business partners to match education to industry demands, and producing graduates who are not only informed but also flexible and creative (World Bank, 2021).

Limitations

When evaluating the results, it is important to take into account the limitations of this study. The sample size

Conclusion

The purpose of this study was to investigate how emerging technology and a leadership-driven approach might revolutionize HEIs in Zimbabwe. Through data analysis, important insights can be obtained about how technology adoption and leadership styles can improve the development of human capital, ultimately giving

Recommendations

Based on the findings of this study, the following recommendations are made:

- *Invest in infrastructure and resources:* Policymakers and educators should prioritise investing in infrastructure and resources for technology use in education. This includes providing access to reliable internet connectivity, hardware, and software.
- Provide training programmes: HEIs should provide comprehensive training programmes to equip staff with digital literacy skills. These programmes should be ongoing and tailored to the specific needs of educators.
- *Encourage leadership approaches:* HEIs should encourage leadership approaches that foster innovation and adaptability in technology-driven education. This includes

Implications and Future Directions

responsible.

Interactive virtual reality simulations, online learning platforms that provide access to worldwide resources, and AI-powered technologies that customize learning experiences are all examples of how educational leaders envision their lecture halls changing. To realize these potentials, this paradigm requires a purposeful and well-funded strategy.

This model demonstrates how the effectiveness of leadership and the efficient use of technology are closely related to the results of graduates who leave HEIs with excellent digital literacy, critical thinking skills, and the ability to innovate and solve real-world challenges.

was restricted to 200 individuals from Zimbabwean HEIs, which would have constrained how far the results can be applied. Furthermore, the study used self-report data, which could be biased toward social desirability.

graduates the tools they need to succeed in a cutthroat global environment. The positive perceptions of educational leaders towards technology and the strong relationship between leadership and graduate employability underscore the potential for technology to drive educational transformation in Zimbabwe.

> promoting transformational leadership styles that inspire and empower educators to embrace new technologies.

- *Promote collaboration*: Collaboration among HEIs, industry partners, and government agencies is essential for driving sustainable human capital development. Educational leaders should actively seek partnerships that leverage resources and expertise to address common challenges and achieve shared goals.
- Develop supportive policies: Governments should develop supportive policies that promote technology integration in education. This includes providing funding for technology initiatives, creating incentives for innovation, and establishing regulatory frameworks that ensure data security and ethical considerations.

The findings highlight the importance of leadership in driving educational transformation and human capital development. Integrating emerging technologies can enhance teaching, learning, and research within HEIs, contributing to improved educational outcomes. Future research should focus on:

- Developing models for the long-term application of technology in education.
- Examining the effect of technology on students' learning outcomes in contexts with limited resources.

Conflict of Interest

We declare no conflict of interest.

References

Abbad, M. M. (2021). Using the UTAUT model to understand students' usage of e-learning systems in developing countries. Education and Information Technologies, 26(6), 7205-7224.

Abbas, S., Hisham-Ul-Hassan, K., & Raza, S. (2024). The role of transformational leadership on employee's innovative performance in colleges in punjab. *International Journal of Human and Society*, *4*(1), 46-63.

ADENIRAN, A. O. (2025). Understanding Cronbach's Alpha in Social and Management Studies. *Current Science Research Bulletin*, 2(02), 11-16.

Adeofe, I. S., & Adedoyin, S. F. (2022). Big data analytics in education: A systematic review. Journal of Educational Technology, 18(4), 321-335.

Ahn, J., & Shin, N. (2018). The effects of classroom climate and technology use on self-directed learning among middle school students. **Computers & Education**, **118**, 115-125.

Alaghbari, M. A., Ateeq, A., Alzoraiki, M., Milhem, M., & Beshr, B. A. H. (2024). Integrating technology in human resource management: innovations and advancements for the modern workplace. In **2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS)** (pp. 307-311). IEEE. Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology Acceptance Model in M-learning context: A systematic review. **Computers & Education**, **125**, 389-412.

Baker, R. S. (2010). The role of learning analytics in the future of education. **Proceedings of the2010 Educational Data Mining Conference**, 1-10.

Baker, R. S. J. D. (2010). Data mining for education. International encyclopedia of education, 7(3), 112-118.

Bass, B. M. (1985). Leadership and performance beyond expectations. New York: Free Press.

Bass, B. M. (1985). Leadership: Good, better, best. Organizational dynamics, 13(3), 26-40.

Bass, B. M., & Avolio, B. J. (Eds.). (1994). Improving organizational effectiveness through transformational leadership. sage.

Bryman, A., Becker, S., & Sempik, J. (2018). Social Research Methods. Oxford University Press.

Camps, J., & Rodríguez, H. (2011). Transformational leadership, learning, and employability: Effects on performance among faculty members. *Personnel Review*, 40(4), 423-442.

Chigwedere, C. (2023). An Assessment of the Consistency Gap in Developing Countries: A Case of Zimbabwe's ICT Regulatory Framework.

Chigwedere, O., et al. (2023). The impact of virtual reality on learning outcomes: A study in Zimbabwean HEIs. **Journal of Educational Technology**, **15**(2), 123-135.

Chirisa, I. (2024). Leadership and the Changing Higher Education Landscape in Zimbabwe since 1980: Surviving the Storms and University Relevance in Zimbabwe. *The Bloomsbury Handbook of Context and Transformative Leadership in Higher Education*, 84-104.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. **MIS Quarterly**, **13**(3), 319-340.

Davis, F. D. (1989). Technology acceptance model: TAM. Al-Suqri, MN, Al-Aufi, AS: Information Seeking Behavior and Technology Adoption, 205(219), 5.

Day, C., Sammons, P., & Gorgen, K. (2020). Successful School Leadership. Education Development Trust.

Ekuma, K. (2024). Artificial intelligence and automation in human resource development: A systematic review. **Human Resource Development Review**, **23**(2), 199-229.

Field, A. (2024). Discovering statistics using IBM SPSS statistics. Sage publications limited.

Ghasabeh, M. S., Soosay, C., & Reaiche, C. (2015). The emerging role of transformational leadership. Journal of Developmental Areas, 49(6), 459-467.

Ghasabeh, M. S., Soosay, C., & Reaiche, C. (2015). The emerging role of transformational leadership. *The Journal of Developing Areas*, 49(6), 459-467.

- Exploring the ethical implications of ICT integration into education.
- Investigating the role of policy in

By addressing these issues, policymakers and educators can work together to create a more equitable and effective education system that prepares graduates for success in the 21st-century workforce. GN, S., Chasokela, D., & Mangena, A. (2024). Barriers to Access, Equity, Success and Inclusion to Higher Education, the Zimbabwean Context. Acta Scientific COMPUTER SCIENCES Volume, 6(5).

Goldin, C. (2024). Human capital. In **Handbook of cliometrics** (pp. 353-383). Cham: Springer International Publishing. Guan, C., Mou, J., & Jiang, Z. (2020). Artificial intelligence innovation in education: A twenty-year data-driven historical analysis. *International Journal of Innovation Studies*, *4*(4), 134-147.

Kalyani, A., Bloom, N., Carvalho, M., Hassan, T. A., Lerner, J., & Tahoun, A. (2024). *The diffusion of new technologies* (No. inetwp222). Institute for New Economic Thinking.

Kalyani, L. K. (2024). The Machine Will Think: AI in Education. International Journal of Scientific Research in Modern Science and Technology, 3(2), 21-26.

Kalyani, L. K. (2024). The role of technology in education: Enhancing learning outcomes and 21st century skills. *International journal of scientific research in modern science and technology*, *3*(4), 05-10.

Kgari-Masondo, M. C., Chingwanangwana, B., Umejei, A. L., Zulu, S. P., Zondi, B. C., Darong, G. G., & Out, M. A reflective study of supervisors in Higher Education on humanistic strategies of working with 'difficult 'students during COVID-19: Umuntu Akalahlwa supervisory style.

Kgari-Masondo, M., & Chingwanangwana, K. (2024). Leadership in education: A transformative approach. African Journal of Educational Studies, 12(3), 45-67.

Lee, K. W., & Han, A. (2021). World Bank Education Sector: From Internal and External Perspectives. *Journal of International Development Cooperation*, *16*(1), 61.

Madhumithaa, N., Sharma, A., Adabala, S. K., Siddiqui, S., & Kothinti, R. R. (2025). Leveraging AI for personalized employee development: A new era in human resource management. Advances in Consumer Research, 2, 134-141.

Mafa, I. H., & Chigwedere, C. (2025). Digital Socialisation and self-identity: Psychosocial challenges faced by Generation Z adolescent girls while navigating social media platforms. *Journal of Social Development in Africa*, 40(1), 62-85.

Maringe, F., & Sing, N. (2014). Higher education policy in Zimbabwe: A critical review. Journal of Higher Education Policy and Management, 36(3), 321-335.

Maringe, F., & Sing, N. (2014). Teaching large classes in an increasingly internationalising higher education environment: Pedagogical, quality and equity issues. *Higher Education*, 67, 761-782.

Melnyk, B. M., Tan, A., Hsieh, A. P., & Gallagher-Ford, L. (2021). Evidence-based practice culture and mentorship predict EBP implementation, nurse job satisfaction, and intent to stay: Support for the ARCC© model. *Worldviews on Evidence-Based Nursing*, *18*(4), 272-281.

Moghtader, B. (2021). Schooling humans as a form of capital: The national and imperial context. In *World Yearbook of Education 2022* (pp. 103-118). Routledge.

Mpofu, Q., & Sebele-Mpofu, F. (2024). A Comparative Review of the Incorporation of AI Technology in Accounting Education: South Africa and Zimbabwe Perspective. *International Journal of Social Science and Religion (IJSSR)*, 329-354.

Mufanechiya, A., & Dube, B. (2024). The Regime and Lecturers in Higher and Tertiary Education State Institutions in Zimbabwe. **Regime and Education in Zimbabwe: Unpacking Post-Independence Curriculum Crisis**, 139. Mustafy, T., & Rahman, M. T. U. (2024). *Statistics and Data Analysis for Engineers and Scientists*. Berlin/Heidelberg,

Germany: Springer.

Muzari, T. (2023). Integrating Public Private Partnership Strategy for Sustainable Students Skills Development in Technical and Vocational Education and Training in Zimbabwe. *British Journal of Multidisciplinary and Advanced Studies*, 4(5), 1-16.

Nherera, C., & Mukora, F. N. (2024). Digitalisation of Higher Education in Zimbabwe: A Challenging Necessity and Emerging Solutions. Journal of Comparative & International Higher Education, 16(2).

Nwogbo, D. C. (2017). Management and Funding Challenges Facing Higher Institutions in Some African Countries. West African Journal of Open and Flexible Learning, 5(2), 1-20.

Richard, H. T., & Simankane, T. (2020). Transformational Leadership: Investing in Followers' Development. *Journal of Education and Society*, 4(1), 67-75.

Russell, S. J., & Norvig, P. (2009). Artificial Intelligence: A Modern Approach. Pearson. Salimi, F. (2025). Aligning policy and practice: The World Bank's approach to EdTech in Sub-Saharan Africa. *Policy Futures in Education*, 14782103251324275.

Samodien, M., Du Plessis, M., & Van Vuuren, C. J. (2024). Enhancing higher education performance: Transformational, transactional and agile leadership. *SA Journal of Human Resource Management*, 22, 1-13.

Sandoval-Hernández, A., Isac, M. M., Carrasco, D., & Miranda, D. (2021). Guidelines for data collection to measure SDG 4.7. 4 and 4.7. 5.

Schneegans, S. (2021). *The UNESCO Science Report 2021*. Oxford-London: UNESCO Publishing.
Schultz, T. W. (1963). **The Economic Value of Education**. New York: Columbia University Press.
Stafford, A. (2016). Artificial intelligence in education: Promise and peril. Journal of Educational Technology, 12(1), 56-68.

Taherdoost, H. (2018). A review of technology acceptance and adoption models and theories. *Procedia manufacturing*, 22, 960-967.

Torrance, R. J., Mormina, M., Sayeed, S., Kessel, A., Yoon, C. H., & Cislaghi, B. (2025). Is the UN receiving ethical approval for its research with human participants? *Journal of medical ethics*, *51*(3), 178-181.

UNESCO Institute for Statistics, & United Nations Children's Fund. (2022). From Learning Recovery to Education Transformation Insights and Reflections from the 4th Survey of National Education Responses to COVID-19 School Closures. OECD Publishing.

UNICEF. (2021). What's next? lessons on education recovery: Findings from a survey of ministries of education amid the COVID-19 pandemic.

Vivek, R., & Krupskyi, O. P. (2024). EI & AI in leadership and how it can affect future leaders. World Bank. (2021). **The Human Capital Project: Human Capital Index 2021**. Washington, DC: World Bank. Zaineldeen, S., Hongbo, L., Koffi, A. L., & Hassan, B. M. A. (2020). Technology Acceptance Model' Concepts, Contribution, Limitation, and Adoption in Education. **Universal Journal of Educational Research**, 8(11), 5061-5071.

Zhang, J., & Chen, Z. (2024). Exploring human resource management digital transformation in the digital age. **Journal** of the Knowledge Economy, 15(1), 1482-1498.