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# Introduction

- Globally, the higher education system is undergoing changes due to the emergence of a knowledge society [1].

- Because knowledge is a greater source of national wealth than physical capital, economies worldwide have shifted from being based on money to being based on knowledge

- Both the economy and human conditions can be improved with the support of high-quality education

- Education plays a crucial role in a thriving economy, a better health care system, and a decrease in unemployment and poverty in South Africa, which is why its budget keeps growing
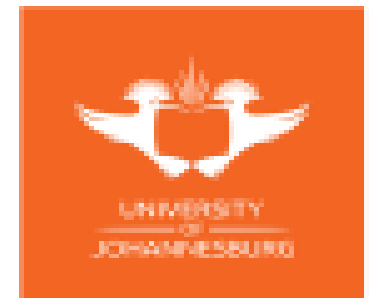
# Introduction



- The government has achieved the goal to increase the number of enrolments.

- However, there is not enough space in 26 SA universities to accommodate students.

- The government has no immediate plans to develop additional Higher Education Institutions (HEIs), so South African institutions should prepare for no further HE expansion [9].

- These are typically long-term projects that take years to complete, even if that is not the case. Given the short number of HEIs and the growing number of students each year, the SA government, through the DHET, is in a challenging position to tackle these concerns, especially in the near future.

- Some of the challenges that is facing SA education are capacity constraints, overcrowded classrooms, geographic barriers, financial constraints and equity gaps among others [10,11].
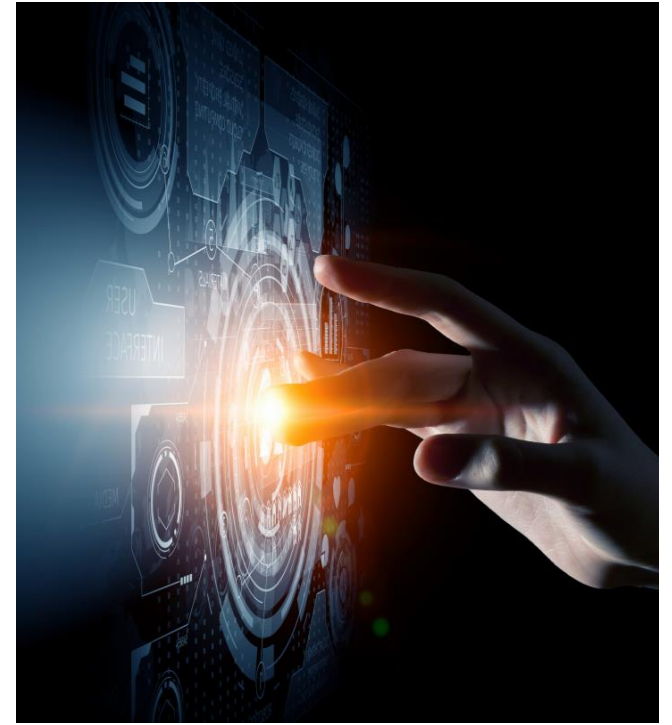
# Research Problem

- The increasing demand for higher education in South Africa (SA) has led to significant challenges, including a shortage of physical study spaces for students.

- Over the past 21 years, South Africa's higher education system has experienced historically high growth in student enrollment,

- 337,158 matriculants vs. 202,000 first-year university places in 2025

# Research Problem

- As universities struggle to accommodate growing student populations

- 19 institutions that received over 4.2 million applications for 131,987 first-year places [7].

- Out of 26 universities, this study will report only 3 and its application results.

- University of Johannesburg had 693 990 applications and only 10500 spaces, Cape Peninsula University of Technology had 518 300 applications and 9 235 spaces, Northwest University had 390 00 and only 12 937 spaces.
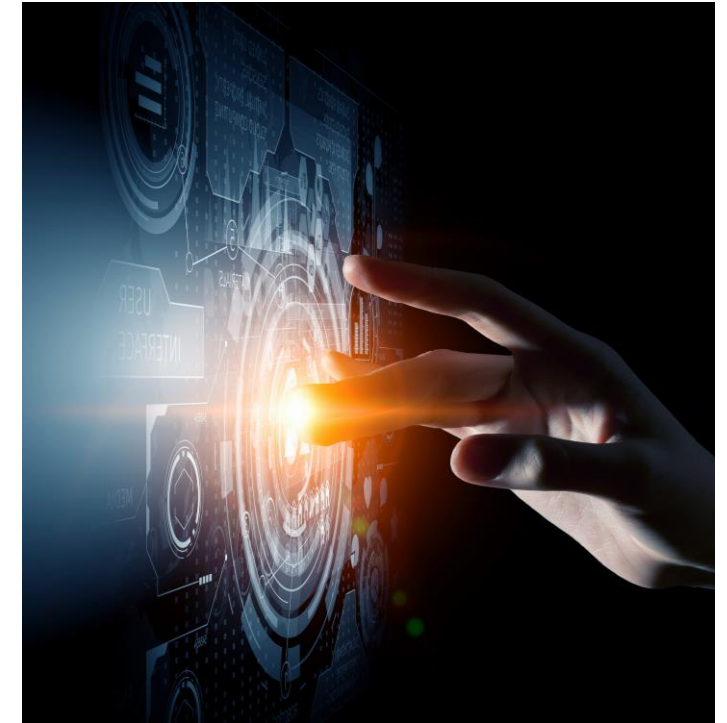
# Research Objective

- This study is aimed at exploring metaverse as one of the solutions to accommodate number of students who cannot access universities and other higher education institutions.

- The study aims to answer the following questions:
- How can the metaverse serve as a recommended transformative solution to address educational challenges, particularly study space shortages, in South African higher education?
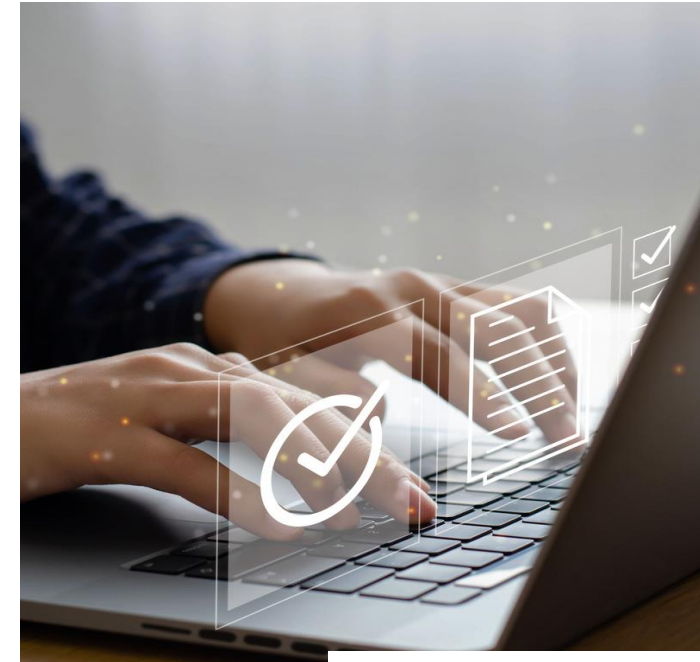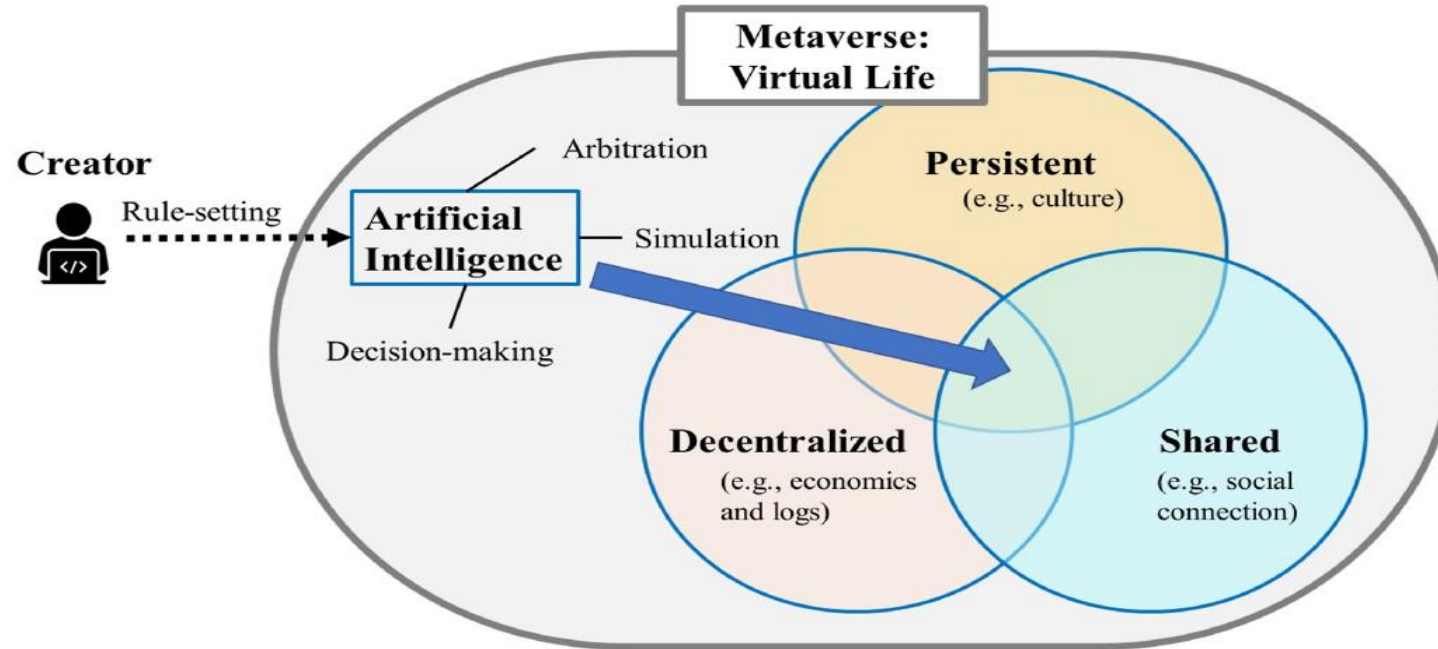
# Literature Review

**Figure. 1.** The framework of a metaverse.

# Literature Review

Table 1: Components of metaverse in education and their use

| Component | Their use in education |
| --- | --- |
| Virtual Reality (VR) | Immersive environment for visual classrooms, laboratories and collaborative spaces. |
| Augmented Reality (AR) | Connecting digital content onto the physical world, facilitating hybrid learning experiences. |
| Blockchain Technology (BC) | Ensure secure credentialing, data management and transparent academic record |
| Artificial Intelligence (AI) | Supports adaptive learning systems and visual tutors (NPC tutors) for personalized learning |
| 5G and Cloud Computing | Facilitates high speed connectivity for seamless access to visual classes |

# Literature Review

**Case Studies** (Table 2):
    **South Korea**: AR-based spinal surgery training.
    **China & Spain**: Project-based learning in metaverse platforms.
    **USA**: Virtual campuses with Meta Quest VR.
    **UAE**: VR/AR for medical procedure simulations.

**Regional Context**: South Africa's adoption is nascent but promising (e.g., Ubuntuland)

• **South African Perspective on Integrating Disruptive Technologies**

• **Challenges incorporating digital technologies into the curriculum**

• **Overview of Current Business School Accounting and Financial Management Curriculum (JBS)**



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# Literature Review

- **Applications** (Table 3):
  - Virtual classrooms, simulations, global collaboration, career training.

- **Benefits** (Table 4):
  - Access to resources, enhanced engagement, inclusivity, cost-effectiveness.
  - Personalized learning, safe experimentation, global networking, future-ready skills.

- **Challenges** (Table 5):
  - High infrastructure costs, digital divide, limited digital literacy.
  - Ethical concerns, data privacy, health issues (e.g., VR motion sickness).
  - Technological barriers, reduced face-to-face interaction.

# Research Methodology



- **Approach**: Qualitative, comparative case study design.

- **Case Studies**: South Korea, China & Spain, USA, UAE, UK.

- **Data Sources**: Academic literature, policy documents, institutional reports.

- **Analysis**: Thematic analysis using [34]'s six-phase framework.

- **Focus**: Contextual framework for South Africa.

# Discussion and findings

Five key themes that guide the successful adoption of the metaverse as a revolutionary solution for South African higher education were identified using thematic analysis.

- **Theme 1: Infrastructure Readiness**
  - Need for high-speed internet, VR/AR devices.
- **Theme 2: Policy Alignment**
  - National strategies for digital transformation.
- **Theme 3: Pedagogical Innovation**
  - Curriculum redesign for immersive learning.
- **Theme 4: Access & Equity**
  - Addressing digital divide with subsidies, multilingual content.
- **Theme 5: Student Engagement**
  - Avatars, gamification enhance motivation.

The Art of Data Interpretation

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# Discussion and findings

**Figure 3:** Proposed Framework for integrating metaverse in SA Higher Education
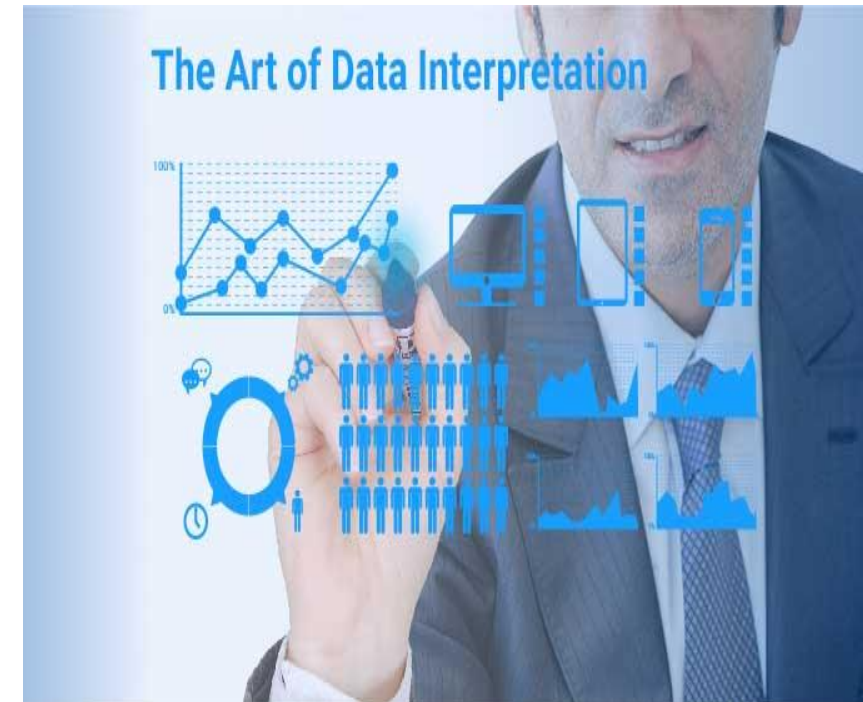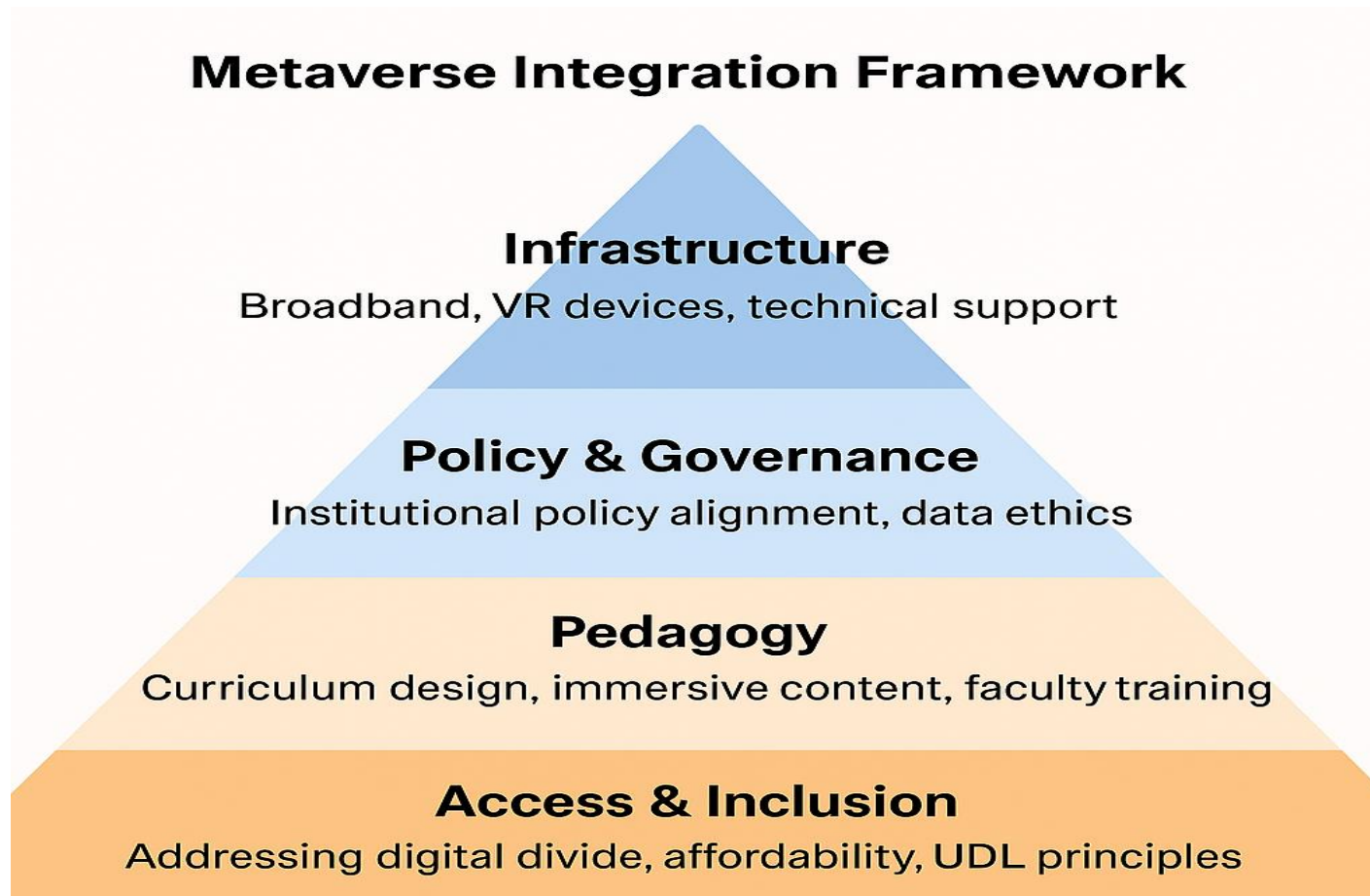
# Findings and Recommendations of the Study

**Table 6**: Recommendations



| |
|---|
| **Invest in Foundational Infrastructure** |
| **Develop a National Metaverse in Education Strategy** |
| **Build Faculty Capacity in Immersive Pedagogy** |
| **Ensure Equity and Access** |
| **Observe the Psychological and Ethical Effects** |
| **Leverage Public-Private Partnerships** |

# Conclusion and Limitations



- **Key Finding**: The metaverse can address study space shortages in SA higher education

  o Enhances learning, increases access, promotes institutional agility

  o Aligns with 4IR and SA's digital skills policy

- **Global Lessons**: South Korea, China, Spain, USA, UAE show success with infrastructure, policy, pedagogy

- **Challenges**: Economic and infrastructural limitations

- **Solutions**: Cross-sector collaboration, strategic investments

- **Framework (Figure 5)**: Infrastructure, policy, and innovative pedagogy for inclusive adoption

- **Contribution**: Advances digital transformation research with practical insights for emerging contexts
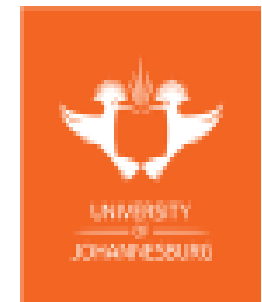
# Grazie for your attention!

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