DFI Funding and Infrastructure Development in South Africa: A Case of Under-Resourced Schools in Northern Cape

A Dissertation

presented to

The Development Finance Centre (DEFIC)

University of Cape Town Graduate School of Business

In partial fulfilment

of the requirements for the Degree of

Master of Commerce in Development Finance

by

Jonita Phatheka Jack

JCKJON005

08 May 2025

Supervisor: Prof. Abdul Latif Alhassan

Declaration

I, Jonita Phatheka Jack (JCKJON005), hereby declare that the work on which this thesis is based is my original work (except where acknowledgments indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university. I authorise the University to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signature: JPJACK

Date: 2025/05/08

Abstract

This study investigated the role of Development Finance Institutions (DFI) in addressing infrastructure deficits in under-resourced schools in the Northern Cape, South Africa, and their impact on educational performance. The research problem is centred on the persistent lack of adequate infrastructure in schools, which hinders access to quality education and exacerbates educational inequalities. The study sought to explore how DFI-funded infrastructure projects contribute to improving the physical learning environment, access to educational materials, and the long-term sustainability of educational development in disadvantaged areas. The research employed a qualitative approach, utilising in-depth interviews with key stakeholders, including school administrators, government officials, and DFI representatives. Additionally, a qualitative analysis of financial data was conducted to assess the allocation and impact of DFI funding. This methodological approach provided a comprehensive understanding of the mechanisms through which DFIs influence educational infrastructure and the factors that affect the effectiveness of their interventions.

The findings of the study revealed that DFIs have made significant contributions to enhancing the physical infrastructure of under-resourced schools. Key outcomes included the construction of new classrooms, libraries, and laboratories, as well as the renovation of existing facilities. DFI funding also improved access to essential educational materials, such as textbooks, digital tools, and e-learning platforms, thereby enriching the learning environment. The study also highlighted the importance of future-oriented strategies to ensure sustainable infrastructure development, particularly considering technological advancements and the need for inclusive education that caters to diverse learner needs.

The conclusions of the study underscored the need for improved accountability, streamlined procedures, and stronger collaboration among DFIs, government bodies, and local communities to ensure long-term sustainability of infrastructure projects in South Africa's education sector. It offers policy recommendations and suggests future research on learner outcomes and community engagement. This research provides valuable insights for policymakers, educators, and development practitioners seeking to address infrastructure challenges in South Africa's education sector

Acknowledgements

First and foremost, I would like to thank God. He has given me strength and encouragement throughout all the challenging moments of completing this thesis. I am truly grateful for His unconditional and endless love, mercy, and grace.

I would also like to express my deepest gratitude to my Supervisor, Prof. Abdul Latif Alhassan, for his continuous support, expert guidance, and invaluable feedback throughout the course of this research. His insights and encouragement have been pivotal in shaping this thesis.

Finally, I owe my deepest appreciation to my family, my partner Mbulelo, my grandmother Sanna Jack, and my lovely two kids Zingce and Zinathi for their unconditional love, patience, and encouragement throughout this journey. Their unwavering support has been the foundation of my strength and perseverance.

Table of Contents

List of Figures

List of Tables

Acronyms

AfDB	African Development Bank
ASIDI	Accelerated Schools Infrastructure Delivery Initiative
CFO	Chief Financial Officer
DBE	Department of Basic Education
DBSA	Development Bank of Southern Africa
DFI	Development Finance Institution
ECD	Early Childhood Development
ECIC	Export Credit Insurance Corporation
EFA	Education for All
EIG	Education Infrastructure Grant
ESA	Education Support Areas
FDI	Foreign Direct Investment
GEM	Global Education Monitoring Report
ICT	Information and Communications Technology
IDC	Industrial Development Corporation
LIS	Library and Information Services
MEA	Minimum Education Areas
NEIMS	National Education Infrastructure Management System
NCDOE	Northern Cape Department of Education
NDC	Nationally Determined Contributions
OECD	Organisation for Economic Co-operation and Development
PIRLS	Progress in the International Reading Literacy Study
SDG	Sustainable Development Goals
SGB	School Governing Body
SIBG	School Infrastructure Backlog Grant
TIMMS	Trends in International Mathematics and Science Study
TVET	Technical and Vocational Education and Training

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Development Finance Institutions (DFIs) are global financial institutions that take part in providing aid and resources, especially in terms of a variety of financial services, for the stimulation of capital flows - from private or developed nations - to developmental projects aimed at specific areas or sectors needing support. This is particularly crucial when risk financing is inaccessible. DFIs are intended to serve as public economic catalysts by fostering sustainable economic growth and development through the provision of risk capital and the implementation of strategic initiatives that stimulate new growth activities, sustainable development, and economic possibilities. The investments align with the government's development plans and prioritise sustainable and environmentally friendly growth. It emphasises developmental objectives over simple financial viability and profit generation. As awareness of their social responsibilities increases, there is escalating pressure on the international agenda, encompassing the Sustainable Development Goals (SDGs) (Marbuah *et al*, 2022).

The study examined the role of DFIs in funding and infrastructure development, focusing on their impact on under-resourced schools in the Northern Cape, South Africa. The Northern Cape, characterised by its vast geographical expanse and socio-economic challenges, represents a critical case for understanding the intersection of governmental policy, private sector involvement, and educational infrastructure. Despite efforts to address inequalities in the education system, many schools in the region continue to face significant barriers in terms of physical infrastructure, resources, and access to quality education. This research aimed to explore the effectiveness of DFI funding in bridging these gaps, assessing how financial support for infrastructure development can enhance the educational experience in marginalised communities. Through an analysis of existing models, challenges, and outcomes, the study sought to provide a comprehensive understanding of how DFIs can contribute to addressing the infrastructure deficits within the educational sector.

1.2 Background of the Study

Researching on DFI is not foreign in this kind of research primarily, international agencies advocate for infrastructure development initiatives. UNICEF, the United Nations International Children's Emergency Fund, endeavours to provide access, enhance learning competencies, and

assist in emergencies across 190 nations via the UNICEF Education Plan 2015-2030 (UNICEF, 2019). UNESCO (the United Nations Educational, Scientific, and Cultural Organisation) concentrates on the educational sector via the World Education Agenda 2030 and the Global Education Monitoring Report (GEM) (UNESCO, 2020). UNESCO has underscored infrastructure safety by creating several technologies, including VISUS (UNESCO, 2019).

Educational infrastructure quality remains a crucial determinant of learners' outcome and equity in education globally. DFIs, such as the World Bank and the Asian Development Bank, have shown their involvement by supporting education systems through funding infrastructure in low-and middle-income countries. The World Bank in India has, for instance, strengthened Teaching-Learning and Results for States (STARS); the project has made a significant investment in school infrastructure to improve learning outcomes (World Bank, 2021). The African Development Bank (AfDB) has done the same in Kenya, co-funding school construction and rehabilitation projects aimed at reducing overcrowding and improving access to quality education in rural areas (African Development Bank, 2020).

Sub-Saharan Africa - at the continental level - continues to encounter substantial disparities in school infrastructure, particularly in rural and under-resourced communities. In Ghana and Tanzania, studies have shown that inadequate classrooms, poor sanitation, and lack of learning materials are the major affecting factors of student attendance and performance (UNESCO, 2022). DFIs have been involved in addressing these gaps by financing large-scale infrastructure projects. Long-term sustainability, maintenance, and the alignment of infrastructure investments with educational outcomes is a concern and remain unresolved.

Infrastructure backlogs in rural public schools - especially in provinces like the Northern Cape - continue to destabilise educational quality and equity. Even though opportunities or initiatives such as the Education Infrastructure Grant (EIG) and Accelerated Schools Infrastructure Delivery Initiative (ASIDI) are implemented, many schools function without basic amenities such as libraries, laboratories, or sanitation facilities (DBE, 2023). Supplementary funding and technical support are needed, which DFIs are progressively stepping in to provide.

The Northern Cape is a province that has encountered above-average challenges in developing school infrastructure. The province faces several significant challenges. The primary adverse effect of these challenges is suboptimal student outcomes in schools within the Northern Cape. The prevalence of underperforming students is elevated by failure rates consistently surpassing

the national average at specific key performance indicators. Correlations exist between inadequate educational infrastructure and student outcomes. This supports the study's emphasis on funding, as the government has been actively working to address the shortfall in financial allocation. An intervention at this level has the potential to foster change.

The study, therefore, sought to explore the role of DFI funding in infrastructure development of under-resourced schools in the Northern Cape province of South Africa. In South Africa, and particularly in the Northern Cape, the development of school infrastructure has been an ongoing challenge. The province consistently faces above-average difficulties, with inadequate facilities contributing to suboptimal student outcomes. Schools in the region experience higher-than-average failure rates, exacerbated by poor learning environments. While the government has recognised these issues and has attempted to address financial shortfalls, funding remains insufficient to meet the demand for sustainable educational infrastructure (Mokgwathi 2023).

Despite global and regional initiatives supporting educational development, a gap persists in understanding the effectiveness of DFI interventions in local educational infrastructure. Limited research exists on how DFIs contribute to resolving infrastructure deficiencies in South African schools, particularly in the Northern Cape. This study aims to bridge this gap by assessing the role and impact of DFIs in financing educational infrastructure in underprivileged regions.

1.3 Research Problem

In terms of the 2024 Department of Basic Education's (DBE) Action Plan and the National Development Plan (NDP) 2030, educational outcome improvement in under-resourced schools is a top priority in South Africa's educational policy agenda. A strong emphasis is placed on the policies to provide all students with fair access to high-quality education and proper infrastructure. Funds have been allocated by DFIs more frequently to educational infrastructure projects, especially in under-resourced provinces like the Northern Cape. Recently, the National Senior Certificate (NSC) results and the Annual National Assessment (ANA) continue to show persistent regional differences in learner performance despite these efforts, especially in schools with subpar facilities (DBE, 2020).

The DBE Annual Report of 2023 also confirms that over 2,700 schools do not have facilities like water, sewerage, or power in South Africa. This is mostly the case in rural provinces like the Northern Cape. There are still funding and delay problems with the EIG, even though the

program is still working. Schools are funded through hybrid financing by DFIs like DBSA and Public-Private Partnerships (PPP) to solve these problems (DBSA, 2020; World Bank, 2022).

The 2021 report by the National Education Infrastructure Management System (NEIMS) states that nearly 80 percent of under-resourced schools in the Northern Cape operate with facilities below the minimum norms and standards (DBE, 2021). This has been associated with declining learner performance, lower attendance, and higher dropout rates (Spaull *et al*., 2022). Without sufficient infrastructure, efforts to improve teaching quality and learner outcomes remain limited.

According to du Plessis and Mestry (2019) provincial governments are unable to give rural schools the funding they need to help ensure that students receive high-quality education, largely due to budgetary limitations. Additionally, the lack of physical and human resources by educational authorities means that parents bear a heavy burden of providing their children with basic supplies like stationery and cleaning supplies.

Among the 87 schools in Pixley Ka Seme District in the Northern Cape Province (62 primary schools and 25 high schools), 80 percent are under-resourced (NCDoE, 2022). Their significant obstacles are mostly caused by inadequate infrastructure development. One major issue in education is a shortage of resources, which has a detrimental impact on classroom instruction and learning (Khumalo & Mji, 2014). Relatedly, it is shown that poverty-related aspects of rural living, as well as a lack of basic infrastructure and amenities in schools, negatively impact the ability to recruit skilled instructors (Mabogoane & Patel, 2006). Due to their bad matric grades, most learners stop their studies after matriculation, leaving them with inadequate education. Some even stop their education in the eighth grade, which raises the unemployment rate and perpetuates poverty. Gaining knowledge through education can improve a person’s life in several ways, including employability, the capacity to go into further education, and the nation's economy through the addition of more skilled workers.

The policy framework assumes there is a positive relationship linking improved school infrastructure and learners’ success. There is a notable gap in research directly investigating this link within the distinctive unique settings of the Northern Cape. This relationship has not been tested thoroughly within the distinctive socio-economic and geographic landscape of the Northern Cape. This leaves the question: are these infrastructure improvements truly making a difference in the lives of learners and teachers in these areas?

Close attention needs to be given to the real-world impact of DFI-funded infrastructure projects. Are these newly built classrooms and facilities bettering learner's grades, school attendance, and making them feel more motivated? This research aimed to determine whether teachers are benefiting from these improvements and how they are doing so. It sought to provide concrete evidence on the impact of DFI-funded infrastructure projects on educational outcomes in under-resourced schools. By understanding these effects, the study can better inform policy decisions and ensure that development funds are utilised in the most effective manner to support learners and educators in these communities.

1.4 Research Questions

The dissertation seeks to address the research question on the contribution of DFI funding to the development of educational infrastructure and the improvement of educational outcomes in under-resourced schools in the Northern Cape. The specific question is:

- What is the role of DFI-funded infrastructure development in improving educational outcomes in under-resourced schools in the Northern Cape?

1.5 Research Objectives

The main objective of this dissertation is to understand the role of DFI funding on the development of educational infrastructure and its influence on educational outcomes in under-resourced schools in the Northern Cape. The specific objective is:

- To explore the role of DFI-funded infrastructure development in improving educational outcomes in under-resourced schools in the Northern Cape.

1.6 Scope and Justification of the Study

This study focused on the role of DFIs in funding and facilitating the development of educational infrastructure in under-resourced schools within the Northern Cape. The research will specifically assess the scope of DFI financial contributions towards infrastructure projects, the challenges encountered in utilising these funds effectively, and the direct impact on educational outcomes, such as student performance, teacher satisfaction, and overall school functionality. The study will also examine the interaction between DFI investment and local government or educational authorities in terms of project implementation and sustainability.

The justification for this study lies in the critical need to address the infrastructural disparities in South Africa's educational sector, particularly in marginalised areas like the Northern Cape. Despite the substantial efforts made by both the government and private sector to support education, many schools continue to operate in poor conditions, which hinder the academic potential of students. DFIs, with their focus on sustainable development, are increasingly seen as key players in addressing these challenges. However, there is a significant gap in the literature regarding the effectiveness of DFI funding in improving educational infrastructure, especially in remote regions.

By providing empirical evidence on how DFI contributions influence the quality of education, this study will fill a vital gap in understanding the potential of DFIs to foster long-term educational improvements. The findings will be of particular value to policymakers, educators, and development finance practitioners, as they will offer insights into optimising DFI investments and ensure they are directed towards initiatives that deliver tangible, measurable improvements. This research will also underline the importance of well-constructed and adequately resourced learning environments in boosting student performance and enhancing educational equity.

1.7 Organisation of the Study

This study will be divided into five Chapters, structured as follows:

Chapter 1: Introduction

This Chapter provides background to the study and states the research problem, the research objectives and research questions. This Chapter will also indicate the aim and significance of the study and provide the Chapter organisation.

Chapter 2: Literature Review

The second Chapter reviews the existing literature regarding DFI Funding and Infrastructure Development of South African Schools. The literature is divided into two frameworks, theoretical and conceptual, to identify gaps in the existing literature.

Chapter 3: Research Methodology

This Chapter covers the research design and the instruments to be used in the design. A detailed description of research design, pilot study, targeted population, sampling techniques, sampling size, and research instruments for data collection are outlined. Analysis of data-collection is examined before concluding with a discussion about ethical issues related to the research.

Chapter 4: Discussion of Results and Interpretation of Findings

Findings of the research - and analysis of the results - are presented in Chapter 4. Research findings are linked to previously reviewed literature, thereby and subsequently identifying similarities or divergence with existing trends, which ultimately forms the basis of future research.

Chapter 5: Conclusion and Recommendations

This Chapter concludes the research by summarising the main arguments and suggesting recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter critically analyses existing literature on the role of DFIs in school infrastructure development, the relationship between improved infrastructure and educational outcomes, and the challenges associated with utilising DFI funds. The review integrates Human Capital Theory and Sen's Capability Approach as theoretical foundations to assess the significance of school infrastructure investment. By addressing key gaps in research, this study contributes to the discourse on optimising DFI funding for sustainable educational improvements.

2.2 Definition of Concepts

2.2.1 Development Finance Institutions

The Organisation for Economic Co-Operation and Development (OECD) (2019) defines DFIs as:

> *specialized development banks or subsidiaries set up to support private sector development in developing countries. They are usually majority-owned by national governments and source their capital from national or international development funds or benefit from government guarantees. This ensures their creditworthiness, enabling them to raise large amounts of money on global capital markets and provide financing on very competitive terms.*

Ingram and Mosbacher (2018) define development finance as:

> *the use of public sector resources to facilitate private sector investment in low- and middle-income countries where the commercial or political risk are too high to attract purely private capital, and where the investment is expected to have a positive developmental impact on the host country.*

Burge *et al*. (2024) define development finance as:

> *specialised financial institutions established to support economic development, majority-owned by government, which can include national development banks (NDBs) and multilateral development banks (MDBs). Despite their limited number, their flows are far from anecdotal. For example, existing estimates suggest that their investments account*

for about 20% of FDI in Africa (L'eon, 2024). DFIs are not expected to replicate the actions of private investors; rather, they support projects that have positive but low (short-term) returns and/or are too risky for private investors to finance. In essence, DFIs increase overall investment in developing countries, rather than simply crowding out private investment (Carter *et al*., 2021)

The challenge lies in the uncertainty surrounding the extent to which re-engineered roles of DFIs contribute to socio-economic transformation in South Africa. Despite the substantial government funding allocated to these DFIs, the progress of socio-economic development in South Africa has been notably sluggish. Hence, the government has persistently faced the problem of achieving sustainable economic growth to reduce inequality and eradicate poverty (Barnard, 2016).

2.3 Infrastructure Development in Education

Educational infrastructure encompasses physical structures such as classrooms, laboratories, libraries, and other supporting infrastructure like sanitation and access to information technology (Barrett *et al*., 2019; Murillo & Ozcan, 2021). The quality of school facilities is also linked to higher teacher retention rates in urban school districts.

Educational facilities play a crucial role in creating a conducive learning environment. Research shows that the quality of school facilities is directly related to students' academic performance. According to Jaya *et al*., (2023) and Arroyo *et al*., (2023), conducive learning environments positively impact both student and teacher performance. Addressing these challenges is essential for leveraging education as a cornerstone for national development. A good indoor environment can enhance overall productivity and health, which ultimately has a positive impact on students' learning outcomes (Oluyemi 2017; Arroyo *et al*., 2023; Yangambi, 2023). Additionally, good school facilities are associated with improved academic achievement among students (Mkwama, 2023; Octavia *et al.,* 2020). Adequate and uncrowded classrooms also contribute to increased student engagement. Acoustic, thermal, and lighting comfort in classrooms significantly impact academic performance (Jaya *et al*., 2023).

2.4 Funding Disbursed by DFIs in South Africa to Support Education

In 2020, the IDC helped three Technical and Vocational Education and Training (TVET) institutions by providing equipment, renovating workshops, and improving curricula. This was

done to ensure that the training offered by these schools met industry standards and regulations, hence enhancing the employment opportunities for students (IDC, 2021).

Table 1

IDC disbursement

Year	2020	2021	2022	2023
Allocation	36.2 million	22.7 million	12.1 million	12.1 million

Source: IDC Integrated Report, 2023

In 2021, IDC (2021) allocated R22.7 million for the implementation of the Whole School Development Programme and the finalisation of nine infrastructure projects in seven schools. The Northern Cape TVET College has been granted R849 958 to finalise Phase 2 of its information and communications technology upgrade. This improvement will directly benefit a total of 6 453 students.

Table 2

DBSA disbursement

Year	2020	2021	2022	2023
Allocation	30 million	15 million	13 million	22 million

Source: DBSA Integrated Annual report, 2023

During the 2019/2020 fiscal year, the DBSA (2020) allocated a total of R30 million towards skills development. This included R19.6 million specifically for training purposes and R10.5 million for tertiary education, internships, and employee development (DBSA, 2020). In 2023 DBSA's assistance to the education sector enhanced educational infrastructure, improved the quality of education, and strengthened capacity building. This, in turn, promoted social and economic development in the Southern African region (DBSA, 2023).

2.5 Under-Resourced Rural Schools in South Africa

Extensive research has conclusively demonstrated that adequate resources are one of the essential elements that augment quality teaching. However, rural schools are faced with disparities due to a lack of resources that negatively shape teaching and learning (Mdodana-

Zide, 2023). Rural schools encounter many obstacles that significantly impact the quality of education they deliver (du Plessis & Mestry, 2019). Among these challenges, limited school resources are one of the most substantial. This limitation encompasses inadequate funding, remote geographical locations, oversized classrooms, and high learner turnover rates. The intricate challenges of limited rural school resources and curriculum management require multifaceted solutions (Naidoo, 2019; Ajani, 2022; Govender *et al*., 2023). While no single approach can tackle all these issues, several strategies can enhance the situation. Increased funding can enable rural schools to secure essential resources, attract skilled teachers, and maintain smaller class sizes (Mdodana-Zide,2023).

2.6 An Overview of Under-Resourced Schools in the Northern Cape

There are 87 schools in Pixley Ka Seme District in the Northern Cape. These are comprised of 62 primary schools and 25 high schools. The provincial DBE in the Northern Cape is divided into five districts (as seen in Table 3):

- Frances Baard, 12,836 km2;
- John Taolo Gaetsewe, 27,322 km2;
- Namakwa, 126 836 km2;
- Pixley-ka-Seme, 103,411 km2; and
- ZF Mgcawu 102,484 km2.

These districts each service between 882 and 3 602 educators, with Namakwa having the least number of educators and Frances Baard having the greatest. In turn, these educators are responsible for the teaching and learning of between approximately 21 655 and 98 543 learners in each district**.**

Table 3

Number of schools, educators and learners per district

District	No. of Public schools	No. of Educators	No. of Learners
Pixley Ka Seme District	88	1 591	45 903
Frances Baard	125	3 353	94 699
John Taole Gaetsewe	170	2 716	79 840
Namakwa	73	852	21 235
ZF Mgcawu	98	2 017	58 584
TOTAL	**554**	**10 529**	**300 261**

Source: Department of Education Northern Cape (2023).

Despite there being progress in the provision of basic school infrastructure since 1994, the provision of school infrastructure is still a challenge in the province. Many Northern Cape schools - in terms of infrastructure - are classified as small or medium, as the average number of classrooms per school for the province is 16. There is, however, still a backlog on Minimum Education Areas (classrooms, Early Childhood Development (ECD) classrooms, science laboratories and media centres) as well as Education Support Areas (ESA) (which includes Nutrition Centres and Administration Spaces, amongst others) within 83 percent of Northern Cape Schools. These are prioritised according to numerous factors (prioritisation strategy). To have all schools operating optimally - and schools that are fully suitable for its required function - these facilities need to be provided with all minimum, supportive, and administrative infrastructure. At present, only 17 percent of schools are functioning at this level with minor infrastructure needs (NCDoE, 2022).

Table 4 provides a summary of the number of seats required per municipality due to the learner ablution ratio:

Table 4

Schools with inadequate sanitation

District Municipality	Total number of schools that require additional toilet seats	Total number of normal toilets seats required
Frances Baard	77	437
John Taolo Gaetsewe	139	1019
Namakwa	40	183
Pixley Ka Seme	59	349
ZF Mgcawu	53	333
Grand Total	**368**	**2321**

Source: Department of Education Northern Cape (2022).

2.7 Impact of Infrastructure on the Learning Environment

The quality and availability of school infrastructure play a crucial role in determining educational outcomes. Well-maintained learning environments contribute to student engagement, academic performance, and overall well-being, while inadequate facilities can hinder learning and exacerbate educational inequalities. The following section explores the relationship between infrastructure and learning outcomes, emphasising the critical role of educational facilities in shaping student success.

2.7.1 Infrastructure as a Determinant of Learning Outcomes

Educational research consistently highlights the role of infrastructure in shaping student performance. According to Mehta and Fine (2015), well-equipped classrooms and facilities contribute to improved concentration, motivation, and academic achievement. Poor infrastructure, on the other hand, leads to disruptions in learning, increased absenteeism, and lower pass rates, as observed in the Northern Cape (Mokgwathi, 2023).

The three-year time limit - according to the Norms and Standards - include all full inappropriate structures (asbestos, wood, metal) and schools with no access to water, sanitation, and electricity. To date, the Department has attended to the three-year time limit plan for basic services but, however, the inappropriate structures are a problem on a higher level due to the cost implications. The Northern Cape currently has 27 schools classified as fully Inappropriate

Structures and an additional ten schools classified as partial Inappropriate Structures (where schools will also have to be replaced). An estimated budget of R2.6 billion will be needed to complete these 37 schools; the Department, however, would attempt to prioritise two replacements of Inappropriate Structures each fiscal year (NCDoE, 2018).

Table 5 shows an example of a school where replacement was implemented and completed by DBSA - through the ASIDI programme - as a full replacement school.

Table 5

NCDOE ASIDI: Inappropriate Structures

Project Name	Project Status	District	Programme description	Target completion	Total Project Cost
ASIDI replacement school: Sternham Intermediate School	Final completion	ZF Mgcawu	Planning and construction on a full-service school	2014-09-29	R 29 774 839.00

Source: Department of Education Northern Cape (2022)

The above assessment indicates that the main issue for addressing fully Inappropriate Structures (asbestos, wood, metal) is that the problem is on higher level due to cost implications of which the Northern Cape Department of Education (NCDOE) budget will not be able to cater for; therefore, this target of eradicating all fully Inappropriate Structures will never be met (NCDoE, 2018).

The information above makes it abundantly evident that the NCDOE does not turn to DFIs to make up the shortfall in its infrastructure budget. The National Treasury has offered an indirect grant to support the ASIDI initiative. The DBSA, the implementation agency, is the one who receives the funding instead of the province.

Table 6

Division of revenue (R'000)

Vote	Name of Allocation	Purpose	Type of Allocation	Province	Column A	Column B	
					2024/2025	Forward Estimates	
						2025/26	2026/27
Basic Education (Vote 16)	Education Infrastructure Grant	To help accelerate construction, maintenance, upgrading and rehabilitation of new and existing infrastructure in education including district and circuit accommodation; to address achievement of the targets set out in the minimum norms and standards for school infrastructure; to address damages to infrastructure; to enhance capacity to deliver infrastructure in education.	General conditional allocation to provinces	Eastern Cape	1 848 180	1 833 206	1 922 558
				Free State	1 007 305	956 895	1 003 515
				Gauteng	2 296 649	2 274 364	1 862 920
				KwaZulu-Natal	2 388 318	2 396 108	2 512 912
				Limpopo	1 503 403	1 473 916	1 545 773
				Mpumalanga	1 310 894	1 273 283	1 335 337
				Northern Cape	716 303	653 639	685 481
				North West	1 304 034	1 266 157	1 327 897
				Western Cape	1 306 354	1 268 558	1 330 391
				Unallocated	-	837 580	845 738

Source: Division of Revenue Bill (2024, p. 90).

One of the main causes of the underfunding of Northern Cape schools is seen in Table 6 Underfunded and historically disadvantaged schools have an uneven starting point, which is not taken into account by the Equitable Share method. The Northern Cape and other more rural provinces have a greater proportion of schools that were underfunded under apartheid and hence need more funding now to construct new schools or renovate subpar ones. It is costly to improve infrastructure, such as giving sport facilities or libraries to the numerous schools who do not already have them; nevertheless, the Equitable Share formula does not take this into consideration. While conditional funds have been used to address infrastructure backlogs in schools, they represent a minuscule fraction of provincial spending when compared to the Equitable Share and have encountered multiple implementation issues.

The NCDOE must work with DFIs to address the issues facing the under-resourced schools. The NCDOE requires a more progressive funding approach that gives rural and impoverished provinces comparatively more money. The existing high levels of disparity between wealthier provinces, schools, and learners and those that are less well-resourced will be challenging to overcome unless these issues with the formula and non-utilisation of DFIs are addressed.

2.8 Conceptual Framework: DFI Investments and Educational Outcomes

DFIs have a crucial role in enhancing social capabilities, encouraging the accumulation of capital, facilitating the catch-up process, and promoting technical advancements. Additionally,

they often serve as a central coordinating entity for various actors involved in the development efforts of countries that are late to the game (Mathews, 2006). DFIs are not simply remedies for market failures; rather, they are influential instruments of policy and politics that aim to allocate resources towards crucial and important sectors that foster economic development and expansion. DFIs occasionally fulfil their developmental role by encouraging investments that aim to establish a dominant player in the national market, capable of competing globally and ensuring consistency in economic policies. This approach also addresses market failures caused by anti-competitive behaviour and can result in a limited Pareto Efficiency equilibrium.

Figure 1 Conceptual Framework

Source: Author, 2024

2.8.1 Financial Investment

DFIs direct financial resources towards educational projects, encompassing activities such as infrastructure development, teacher training programmes, curriculum development, and education technology initiatives (DBSA, 2023). These investments aim to enhance physical learning environments while also addressing systemic inequalities that impact educational outcomes across provinces (World Bank, 2022)

2.8.2 Intermediate Interventions

These investments result in tangible outcomes, including the expansion of school infrastructure, the enhancement of teaching quality, the improvement of access to educational resources, and the rise in educational possibilities. These interventions involve targeted support for struggling learners through small group tutoring or individualised instruction, which has been shown to improve academic outcomes (Education Endowment Foundation, 2021). Additionally, the

implementation of evidence-based teaching strategies, such as explicit instruction and formative assessment, constitutes intermediate interventions aimed at enhancing the quality of teaching and learning for all students (Archer & Hughes, 2011; Black & Wiliam, 1998).

2.8.3 Educational Interventions

These include utilising the intermediate outputs to target and enhance learning results, enrolment rates, and overall educational quality. Educational interventions often use data from assessments to identify learning gaps and adjust instruction, which can affect student achievement (Hamilton *et al*., 2009). Additionally, interventions that involve parental engagement, such as workshops and regular communication, have shown effects on student motivation and academic performance (Fan & Chen, 2001).

2.8.4 Impact on Outcomes

In the end, the educational interventions funded by DFI result in concrete educational achievements, such as greater literacy rates, higher rates of school completion, enhanced academic performance, and increased employability. Investments intended to enhance educational results in underdeveloped nations are largely financed by DFIs. The advancement of educational systems and possibilities can be facilitated by DFI funding for education initiatives, which can have a variety of effects and results. When examining the connection between DFI financing and educational attainment, keep the following important factors in mind:

i) Infrastructure Development:

Funding for the building and refurbishment of classrooms, schools, libraries, and other educational facilities is frequently provided by DFIs. Better educational results, such as higher attendance rates and student engagement, can be attained by improving infrastructure since it helps provide a more favourable learning environment.

ii) Access to Education:

Projects that increase educational opportunities, especially for underprivileged and marginalised groups, may be supported by DFI funding. This can involve providing money for things like scholarships, school lunch programs, transportation assistance, and efforts to close the gender gap in education.

iii) Education Quality:

By offering teacher training programs, developing curricula, and providing educational resources and technology, DFIs can fund projects that improve education quality. Enhancing instruction quality and curricular relevance can have a favourable effect on student learning results.

iv) Innovation and Technology:

DFIs frequently fund creative initiatives that use technology to improve the way that education is delivered. This could entail providing funds for the creation of digital educational resources, internet access in classrooms, and e-learning platforms. Technology access can enhance learning results by enabling tailored and interactive learning environments.

v) Employment and Skills Development:

Education initiatives supported by DFIs may concentrate on programs for students' employment readiness and vocational training. Through the provision of pertinent skills, DFIs can aid in the decrease of youth unemployment and the advancement of economic development.

vi) Empowerment and Community Engagement:

DFI funding can encourage collaborations between parents, schools, local government, and civil society organisations, as well as community involvement in education. Involving communities in educational efforts can result in long-lasting gains in social development and academic performance.

vii) Monitoring and Evaluation:

DFIs usually include monitoring and evaluation procedures in their educational initiatives to guarantee efficacy and accountability. This makes it possible to evaluate how a project has affected students' learning outcomes and pinpoint areas that still need work.

The conceptual framework that connects DFI funding to educational results entails comprehending the correlation between financial investments in education and the subsequent influence on diverse educational indicators.

2.9 Theoretical framework: Human Capital Theory

According to Salawu *et al* (2023), a theoretical framework is a much smaller set of ideas within a given field where a study is being conducted. It is a portion of the conceptual framework. It contains the theories that are relevant to the study being undertaken and the specific theory/ theories on which the study is anchored. This is used to test borrowed and existing theories with the aim of forecasting and monitoring conditions in the context of the current study (Kivunja, 2018).

Human Capital Theory holds that gaining new information endows people with greater cognitive abilities, increasing their productivity and efficiency across a variety of tasks (Becker, 1993). The capacity to learn new information is positively correlated with the body of current knowledge (Cohen & Levinthal 1990; Pienaar & Du Toit 2009). This relationship holds for both explicitly taught knowledge, and implicitly learned knowledge gained through experience in each field (Dimov & Shepherd 2005; Matshekga & Urban, 2013).

Human Capital Theory is the theoretical framework that has gained the most recognition for being the driving force behind the sound adoption of development and education programs. The development of human capital was seen as a crucial component of economic growth, as well as a means of preventing or recovering from major upheaval and instability. This is Human Capital Theory's prevailing position in educational discourse, especially regarding how state education institutions are oriented. This theory seeks to establish a specific framework for state education, both normatively and indicatively. The most crucial strategies for raising the calibre of the labour force were seen to be education and training. Therefore, the economic gains from education and training were greater than those from individual earning capacity. According to the study, economic growth may be achieved by raising the standard, accessibility, and efficacy of the educational system and its products. According to Becker's (1993) argument, countries that enjoyed higher economic growth in the 1960s were those who invested in human capital through educational possibilities, apart from the Warsaw Pact nations. A good foundation in economics is one of the educational offerings that are pertinent to the theory of human capital.

To link Human Capital Theory (HCT) to this study more explicitly, the theory serves as the foundational framework for understanding the impact of education and training on economic growth and development. By focusing on the role of knowledge, skills, and technical know-how in driving productivity and innovation, this study examines how investments in education,

particularly through the lens of DFI funding, can build human capital in underdeveloped regions like Africa.

The study explored how DFI funding could enhance human capital through investments in educational infrastructure, such as the construction and refurbishment of schools, which directly improves access to education. It aligns with the assertion in HCT that improving the quality of education by enhancing facilities, providing teacher training, and fostering a conducive learning environment leads to more productive, skilled individuals. These individuals are then better positioned to contribute to economic development, innovation, and the effective utilisation of natural resources, which is particularly relevant to many African countries that possess abundant natural resources but lack the skilled workforce to harness their economic potential. The inadequate educational institutions and subpar educational infrastructure can be mostly attributed to low investment in education, which is partially caused by a lack of political will for human resource development. The level of education in many African schools is so low that, even after a few years, students graduate without learning any skills or becoming consistently literate. The absence of creative human capital development programs in numerous African nations has led to this outcome (Baah-Boateng, 2013).

By drawing from HCT, the study justified the focus on the role of education in shaping economic futures and demonstrated the relevance of DFI funding as a crucial mechanism for strengthening human capital in areas where it is most needed, particularly in African nations with underdeveloped educational infrastructure and limited access to quality learning opportunities.

One significant barrier impeding the ability of most African countries to attract foreign direct investment (FDI) is the restricted nature of human capital. Undoubtedly, Africa's high educational attainment makes it possible for workers with sophisticated skills to assimilate cutting-edge technologies introduced by FDI, adapt to new production techniques with ease, and improve their ability to quickly catch up with technologically advanced nations. Only when the host nation has enough human resources to absorb the cutting-edge technology that come with the investment can FDI contribute to economic growth (Borensztein *et al*., 1998). Investors prioritise a country's level and capacity of human capital as one of the most crucial factors when deciding to invest. Therefore, investing in human capital is undeniably crucial in attracting FDI. Undoubtedly, a country's progress is contingent upon the cultivation and utilisation of its residents' knowledge and talents to generate wealth. As labour is a component of production,

an increase in the quantity and quality of labour leads to a corresponding increase in productivity. Roux (1994) observed that a country might better utilise and maintain the benefits of technical and technological innovation by investing in its human resources.

Addressing the challenges related to the development of the continent's human resources is an essential initial action towards accomplishing this objective. African governments are showing their dedication to developing a skilled workforce in their countries by increasing the amount of money allocated to education. Therefore, African governments must demonstrate unwavering will to refrain from investing the required funding for developing human capital in their nations. African governments must convincingly demonstrate to a diverse group of stakeholders that allocating resources towards human capital is a strategic investment that will lead to accelerated economic growth and transformation, despite the limited availability of funds (Baah-Boateng, 2013).

In developed nations, state systems fund rural education infrastructure with ample resources, often improved by specialised funding. For instance, Australia's RSAS combines community engagement with infrastructure provision to increase access in remote Indigenous communities (Guenther *et al*., 2022). Similarly, Canada funds First Nations school infrastructure, merging educational goals with social development priorities (Nations, 2020).

Sub-Saharan Africa faces severe infrastructure issues, such as overcrowded classrooms and inadequate water and sanitation. DFIs and NGOs have created school infrastructure funds in countries like Ghana and Kenya, often using results-based financing linked to construction completion or improved student performance (UNICEF, 2021). Ethiopia's GEQIP-E program, co-funded by the World Bank, includes innovative elements such as maintenance budgeting, teacher housing, and performance incentives to retain staff in rural areas (World Bank, 2019).

Public funding plays a crucial role in the development of school infrastructure, particularly in rural areas where innovative solutions are necessary to address existing deficiencies. In South Africa, the EIG aims to establish standards for public schools. However, its efficiency in remote regions is restricted by logistical and governmental challenges (National Treasury, 2023).

DFIs like DBSA, AfDB, and IFC support blended finance models that combine concessional loans, government funds, and private investments. The DBSA notably invests in ASIDI and SAFE initiatives to enhance sanitation and classroom infrastructure through public-private partnerships (PPPs) (DBSA, 2020).

2.10 Empirical Literature

The empirical literature on educational development highlights the significant role of infrastructure, access, quality, and technology in shaping educational outcomes. A review of previous studies underscores the multifaceted challenges faced by many countries, particularly those with limited resources, in providing equitable and quality education.

2.10.1 The Role of Educational Infrastructure

Cohen *et al*. (2017), Shirrell *et al*. (2018) and Spillane *et al*. (2015) defined educational infrastructure as the aspect of the school system that is intended to support, coordinate, and maintain teachers' instructional practice and promote efforts to improve that practice. Educational infrastructure is conventionally referred to as classrooms, laboratories, and playing fields (where learning takes place) but also to curricular materials, student assessments, teacher training, and so on that enable schools to enact their visions (Mehta and Fine, 2015). This research will use Sen's view of development, in the sense of expanding human capital. Lucas (1998) writes: "by the problem of economic development I mean simply the problem of accounting for the observed pattern, across countries and across time, in levels and rates of growth of per capita income." If this were a definition of economic development, it would be narrow and incomplete. It is a view of how development happens, that the characteristics of development, such as health, sanitation, literacy, and life expectancy are all enabled by economic growth. As access to education becomes universal a more pertinent constraint to human capability in many parts of the world, including South Africa, is now the quality of education.

The role of education to development has been framed by the notion of human capital in the economics of education literature, which has burgeoned in the wake of their seminal contributions (Schultz, 1961; Becker, 1962, 1964). Regarding the value of education, Taylor (2010) argues that "[t]he literature has consistently demonstrated that the probability of employment, and earnings conditional upon employment, increase with years of education". Wider participation in education is itself one of the benefits of this remarkable economic development. It is significant that Education for All (EFA) is now a foreseeable reality and is one of the United Nations' Millennium Development Goals.

2.10.2 DFI-funded Infrastructure Projects: Global and Local Case Studies

DFIs finance and promote private investment with the purpose of fostering economic growth and sustainable development while at same time remaining financially viable in the long term. DFIs are government-controlled institutions expected to invest in sustainable private sector projects hoping to spur economic growth. Recent work in the field shows that investment in infrastructure is such a crucial process, though is made more challenging by its multifaceted nature and interrelated stages (Mahabir & Mabena, 2015). These stages involve preparatory and budgeting, handling and oversight responsibilities in monitoring infrastructure, and acquiring skilled manpower to run and repair existing infrastructure (Mahabir & Mabena, 2015).

Few studies have been conducted on the relationship between DFI funding and infrastructure development in under-resourced schools. Thus, this research will add to the current empirical literature on the impact of DFIs on economic growth. Lessons from this study will contribute to developing standards and norms for how DFIs can successfully finance infrastructure development in under-resourced schools in the Northern Cape.

A common trend is the increasing use of blended finance structures, where DFIs combine public and private capital to mobilise investment for large-scale infrastructure projects. For example, in projects like Elazig Hospital, Turkey, and Côte d'Ivoire Energies, DFIs such as the World Bank offer partial credit guarantees, providing risk mitigation to attract private sector investment (Rozenberg & Fay, 2019). Another notable trend is the project cycle approach, seen in initiatives like Climate Investor One and the Malawi Hydropower Project supported by the IFC's InfraVentures, which emphasises a donor-driven, structured financing approach to ensure project viability from the planning phase through to implementation (IFC,2021). Securitisation and co-investment platforms, such as Bayfront Capital in Singapore and MCPP, IFC, represent another trend where DFIs engage in pooling investment through securitised products or co-investment vehicles to diversify risk and attract larger pools of capital for infrastructure development (World Bank, 2023). These trends highlight how DFIs are evolving in their approach to financing infrastructure, blending innovative financial instruments with traditional development support to address the growing infrastructure needs in both emerging markets and developed economies.

The shortage of resources for education in schools with limited resources often hampers the process of teaching and learning. In general, proficient educators tend to choose to teach at schools that have ample resources, even when offered financial incentives. Opting for the appropriate combination of resources is also crucial. In the absence of adequate textbooks or classroom materials, teachers may not be able to enhance the quality of instruction (du Plessis & Mestry, 2019).

Low-income students are doubly disadvantaged when they attend classes in buildings that do not even adhere to the most basic health and safety regulations, let alone the elements that have been shown to enhance students' academic performance. Additionally, if education officials don't make necessary upgrades to a facility that is clearly outdated and in need of repair, these pupils may get the impression that the system doesn't value them as highly as it does students in more affluent locations (Barrett *et al*., 2019).

The Constitution (Republic of South Africa, 1996b), the Schools Act (Republic of South Africa, 1996a), and related regulations and policies on equity indicate that every South African learner should have access to learning and teaching, similar facilities, and equal educational opportunities. This is sadly not the case. Poverty and unemployment that result in the problems mentioned above, directly influence the roles of teachers and the quality of education available to learners in these circumstances (du Plessis & Mestry, 2019).

2.10.3 DFI-Funded Educational Interventions

DFIs were solely established to allocate money for the execution of development mandates, primarily through venture capital, challenge-led, countercyclical, and development roles (Mazzucato & Penna, 2016). The institutions and stakeholders that are responsible for gathering public and private funds to support development and sustainability goals form the foundation of the development finance pyramid. Development stakeholders collaborate to achieve a more equitable distribution of money for developmental objectives by mobilising both public and private sources of finance. Blended finance, a widely used technique in development financing, encompasses various financial products such as first-loss capital, development impact bonds, guarantees and insurance, collective investment vehicles, and performance-based incentives (Habbel *et al*. 2021). The developing world is always coming up with new finance instruments, such as development impact bonds, to address the ongoing problem of how to pay for academic accomplishments. Financial mobilisation through processes and strategies - as well as the use

of the SDG aligned instruments - is undertaken to address these "top of the pyramid" development and sustainable outcomes, which cover economic, social, and environmental impacts. These outcomes have been crystallised into the 17 SDGs across the three main economic agents: nations, firms, and households (Alhassan, 2023).

DFIs operate at the international, regional, national, and local levels. Their owners established them by acts of the national and local legislatures, as well as through regional and multinational agreements. The shareholders require the organisations to provide initial funding and to achieve development impacts while retaining financial sustainability. Among other methods, the main way to get the initial capitalisation is by issuing and selling shares. Conversely, callable capital is set aside for use in the event that operations need to grow or when difficult business conditions arise. When funding projects, DFIs pay for risk rather than profit; so, the operating surplus realised is the outcome of risks that are recognised and appropriately managed to the extent that they don't fully materialise. DFIs are well known throughout the world for establishing and preserving pools of knowledge in the areas of finance, monitoring, and assessment, policy research and analysis, project planning, project management, and project execution. Conditional transfers to DFIs by shareholders are also customary to initiate and implement special development plans (Kibuuka & Shandu, 2020).

2.10.4 Access and Equity in Education

The United Nations' SDG 4 pledges to strive for the provision of inclusive and fair education at every level. The goal is to ensure that, by 2030, all girls and boys can successfully finish primary and secondary education that is free, fair, and of high quality. Additionally, the aim is for all learners to acquire the necessary knowledge and skills to advance sustainable development (Chikoko & Mthembu, 2020).

According to Bot *et al*. (2000: 67), numerous schools in impoverished African communities continue to face the consequences of overcrowded classrooms, inadequate facilities, and a lack of educational resources. Despite these challenges, teachers and students in these disadvantaged schools are still expected to attain the same educational standards as those in well-resourced schools located in more developed urban areas. (Singh & Nela, 2008).

2.10.5 Quality of Education and Learning Outcomes

Emmanuel (2013;11), the OECD (2011;392), and Skelton (2014;4) asserted that school infrastructure has a crucial role in determining the quality of education and is a key component in improving academic success (Maqoqa & Mvenene, 2023), even though in low-income countries resources are scarce.

According to Pillay (1999), the education budget is insufficient to adequately maintain the current infrastructure. As a result, it is unable to address the enormous disparities and inefficiencies that were established and deeply rooted during the previous apartheid era. The insufficiency of government allocation to satisfy South Africa's educational demands is apparent, and the backlog of under-resourced schools remains significant, particularly in schools that were originally intended for Africans (Pampallis, 1998).

The South African National Norms and Standards for school funding (NDoE, 1998) require even the poorest communities to pay financially to meet the necessary needs of their schools, due to the lack of finances or allocation. Therefore, it is anticipated that parents will make a financial contribution to their children's education. While not mandatory, the decision to implement it lies with the School Governing Body (SGB). However, it is an indispensable source of funding for schools. School fees serve as the primary means of acquiring supplementary cash (Singh & Nela, 2008).

Van Dyk and White (2019) prioritised the equal funding of public schools in South Africa to address the educational inequities inherited by the post-apartheid government in 1994. In order to ensure equitable distribution of financial resources, all public schools in South Africa have been classified into five quantiles (DBE, 2015:2017). The socio-economic situations of communities are utilised to rank or classify schools. The National Poverty Table, published by the treasury, utilises data from the national census, including information on income levels, dependence ratios, and literacy rates, to categorise localities based on their poverty level, as per the DBE (2015; 2017), as quoted by Mojapelo and Durodolu (2022). The Northern Cape has a total of 404 schools, classified under quantiles 1 to 3 in the district in 2023. Consequently, many schools in the province are located in impoverished communities that are marked by elevated levels of unemployment.

2.10.6 ICT in Education and Digital Learning Gaps

As previously stated, many former Model C schools in South Africa have adequately equipped and operational facilities, including libraries, labs, computer rooms, and an ample supply of textbooks (Mojape, 2018b). The lack of adequate physical infrastructure remains a significant obstacle in the majority of schools located in impoverished rural communities (Nkondo *et al*., 2014).

The quality of education provided within a school environment directly influences the achievements and academic performance of the students. However, in South Africa, the majority of underprivileged schools, particularly those in quantiles 1 to 3, are considered dysfunctional due to their limited resources. These schools are known for their low-quality teaching and learning, resulting in consistently poor academic performance among students. Only a small number (1 801) of well-equipped and functional school libraries, accounting for 7.23 percent of all schools, provide adequate library and information services (LIS) (Nkondo *et al*., 2014). Many instructors and learners in poor rural regions find it challenging to get information. The limited access to a variety of information sources, including the use of information and communication technologies (ICTs), is identified as a barrier that hinders learners from developing their reading, numeracy, and writing abilities. Grade 4 and 5 learners in South Africa rank poorly in PIRLS and struggle to incorporate ICTs to enhance their motivation for learning. This is a harsh truth (Nkondo *et al*., 2014).

An adequate budget from the Norms and Standards grant is crucial for the procurement, acquisition, and maintenance of ICTs in library facilities at schools, as stated by the DBE in 2004. Due to the high cost of computers, laptops, and their peripherals, more money is necessary to acquire them for all institutions. Acquiring funds is necessary to purchase educational software for various teaching and learning activities (DoE, 2004). Despite the government's introduction of e-education in the school curriculum in South Africa, many provincial DBEs are failing to adequately equip all schools with ICT for the effective implementation of e-education (DoE, 2004).

2.10.7 Challenges and Opportunities in Utilising DFI Funds for School Development

There are several types of DFI's that exist in order to accomplish various objectives and developmental goals. DFI's mobilise both public and private sector funds to finance initiatives in both the public and commercial sectors. They also offer technical guidance to those who get

financial support. The South African government has recognised three prominent financing institutions: the Export Credit Insurance Corporation (ECIC), the DBSA, and the Industrial Development Corporation (IDC).

The primary goal of the DBSA is to expedite socio-economic progress in a sustainable way by providing both financial and non-financial investments in social and economic infrastructure. Social infrastructure involves addressing limitations and obstacles that could impede economic expansion. The institution's main objective, as stated by Qobo and Soko (2015), is to foster sustainable economic development and growth, enhance human resources, and strengthen institutional capacity through the utilisation of both domestic and international public and private resources.

The DBSA (2022) endorses six out of the 17 SDGs, specifically SDG 4 and SDG 10. This endorsement also indirectly supports the South African government's initiatives to modify our Nationally Determined Contributions (NDCs) in accordance with the Paris Agreement. The DBSA is responsible for executing infrastructure projects for the DBE and Provincial Education Department. These projects primarily focus on the development of schools (DBSA, 2022). During the fiscal year of 2013/14, the DBSA allocated a sum of R12.7 billion for infrastructure finance. As part of this allocation, the DBSA successfully constructed 32 schools. The schools were included in the Department's ASIDI, which aims to replace schools constructed with unsuitable materials (such as mud) with properly built facilities that meet basic standards for water, sanitation, electricity, and fencing. ASIDI is a component of the Department's comprehensive strategy to enhance educational accessibility and educational achievements (DBSA, 2014).

2.10.8 Innovations to Scale Up Programs and Increase Efficiency.

In an evolving development landscape, the urgency for DFIs to innovate, adapt and deliver is intensifying. In this context, four discussions focusing on DFIs' additionality and ability to mobilise to private finance, their risk policies, and their development impacts have become pivotal (Forster *et al*., 2023). DFIs have come under increasing pressure to materially scale up investment and mobilisation, increase their risk appetite, and create and sustain new markets in the riskiest emerging economies while remaining profitable (Attridge and Novak 2022).

With total assets of $4 trillion, representing 35 percent of the global DFI portfolio (Xu, *et al*. 2019), China's five PDBs, primarily the China Development Bank (CDB) and Export-Import

Bank of China (Exim), have also radically expanded the idea of what constitutes a DFI. Often characterised as DFIs but with their unique approach, China's 'policy' banks deploy a 'peculiar' means of development finance – funding projects in developing countries with relatively high-interest rate loans, which represents the internationalisation of the finance model that drove China's own recent development (Chen 2020).

DFIs have recently implemented innovations to increase the scale and efficiency of blended concessional finance programs. IFC has introduced several "programmatic approaches," which feature umbrella programs targeted at specific sectors, such as medical equipment, SMEs, microenterprises, low-income households, rural finance, or COVID-19 recovery (DFI, 2020). Each of these programs has an overall framework for the sector, including expected development impact and available concessional instruments (MDB, 2019). This allows both efficiency of processing and increased scale, and facilitates open access to concessional resources by many private firms. EBRD and EIB have also developed programmatic approaches for different sectors, with frameworks for streamlined approval of sub-projects and concessionally developed at the program level. These programs are in areas such as green finance, women in business, recovery from COVID-19, and direct financing of small businesses. Some other innovations developed by DFIs to increase scale and efficiency of blended concessional finance operations include the use of hard approval deadlines and enhanced coordination between DFIs with respect to strategic and operational engagement (DFI, 2021).

During 2025, debates in the climate finance space were preoccupied with the reform of the global financial architecture, policy processes relating to the Baku to Belim Roadmap, and increasing climate finance to $1.3 trillion by 2035 at COP30 (ECCO, 2025). South Africa is also chairing the G20 for the first time. Within this milieu, it is important that the country's domestic goals to achieve the JET are not misplaced.

2.10.9 Empirical Evidence on DFIs and Education Outcomes

Empirical studies indicate a positive but conditional connection between infrastructure investment and learner outcomes. Taylor (2011) and Spaull (2013) highlight that while infrastructure is important, it needs to be supported by effective school leadership and high-quality teaching to achieve sustained improvements.

DFI-funded classroom extensions in Ghana have boosted school attendance and lowered dropout rates (Asim *et al*., 2020). In Rwanda, DFI aid for school construction has enhanced enrolment and retention among girls, especially with sanitation facilities (UNESCO, 2019).

In South Africa, there's a lack of studies linking DFI funding to educational outcomes in provinces like the Northern Cape. Most impact measurements focus on infrastructure completion rather than learning achievements or attendance improvements (DBE, 2017). This study aimed to bridge this gap by correlating DFI-funded infrastructure investments with learner outcomes in under-resourced schools.

2.11 Conclusion

This literature review has explored the role of DFIs in financing school infrastructure, the link between infrastructure and educational outcomes, and the challenges associated with DFI funding utilisation. The review highlights the significance of HCT in framing the study, ensuring a comprehensive understanding of how infrastructure investment contributes to sustainable educational improvements. While DFIs play a crucial role in addressing infrastructure deficiencies, issues such as funding misallocation, maintenance challenges, and disparities between urban and rural schools persist. Addressing these challenges requires innovative financing solutions, stronger stakeholder collaboration, and evidence-based policy interventions. This study sought to bridge the knowledge gap by assessing the effectiveness of DFI interventions in school infrastructure development in the Northern Cape, providing insights for optimising financial strategies in the education sector.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This Chapter outlines the research methodology used in this study to collect, analyse, and evaluate data. It provides a structured approach to the research process, ensuring reliability and validity in addressing the study's objectives. Selecting an appropriate methodology involves defining the research paradigm, approach, and methods. This study adopted a qualitative research approach to gain an in-depth understanding of the impact of DFIs on school infrastructure development in underfunded schools in the Northern Cape. The study sought to explore the challenges these schools face, assess the effectiveness of DFI interventions, and determine strategies to enhance the alignment of funding with local needs.

This Chapter follows Saunders' research opinion and is structured as follows: Section 3.2 presents the research philosophy, followed by the research approach in Section 3.3. Section 3.4 outlines the research design, while Section 3.5 discusses the sampling and population of the study. Section 3.6 explains the data collection methods. Finally, Section 3.7 details the data analysis techniques employed to interpret the findings.

3.2 Research Philosophy

Saunders *et al*. (2019:130) define research philosophy as a set of beliefs and assumptions that link the advancement of knowledge. It refers to the researcher's preparations prior to initiating the investigation. Positivism is defined as the effect of factors used to anticipate the relationships between variables. According to Saunders *et al*. (2016), it is also objective because it evaluates major phenomena using numerical measures or statistics. It necessitates valid research that is truly measurable; its power lies in presenting precise quantitative facts and data, which is why it was utilised in this study.

Phenomenology is an interpretive study that uses direct observation and experience to achieve a thorough understanding of events. Phenomenological approaches investigate phenomena that impact humans. This method describes and identifies phenomena observed by individuals in certain contexts (Harappa, 2021). It focuses on gaining a better understanding of a process (Alamgeer, 2022).

3.2.1 Reasons for Choosing the Phenomenological Philosophy

For this study, a phenomenological philosophy was used as it required the researcher to be objective and independent about DFI Funding and Infrastructure Development in under-resourced schools in the Northern Cape. The human side of the social world and its experiential meaning are relevant to phenomenology. Additionally, this approach was particularly suitable for uncovering the lived experiences of a school District Director, Head of Infrastructure, and principals from under-regarding the persistent underperformance of under-resourced schools despite infrastructure funding. According to Alamgeer, (2022) interpretivism also allows the researcher to reach conclusions using explanatory techniques.

3.3 Research Approach

A researcher thoroughly examines the validity and reliability of a study using a research approach. There are three diverse types of research approaches, distinguished by whether they focus on words, numbers, or both. Schwandt (2007) defined research approach as a systematic theory of inquiry that guides the collection and analysis of data.

This study employed a qualitative research approach, which focuses on understanding concepts, experiences, and social phenomena through in-depth exploration (Streefkerk, 2019). Qualitative research allows for the gathering of rich, descriptive data that provides insights into complex issues that are not well understood (Weinreich, 2009).

Worthen and Sanders (1987) described qualitative research as a method conducted in natural settings, where the researcher actively engages with participants to gather authentic data. This study prioritised an in-depth exploration of social processes, placing emphasis on participants' perspectives rather than solely focusing on outcomes.

3.4 Research Design

Due to the adoption of a qualitative approach in this study, these are the designs that exist: case study, ethnography, grounded theory and phenomenology.

i) Case study:

A case study is an in-depth investigation of an individual, group, or event to gain insights into a real-life phenomenon. It is commonly used in the social sciences and humanities to explore

complex issues and provide insights into specific situations. A case study may involve multiple sources of data, such as interviews, observations, or documents (Coombs, 2022).

ii) Ethnography:

Ethnography is a significant form of qualitative research in which the researcher observes or interacts with the target population. The researcher plays a crucial role in acquiring valuable cultural information, which is why ethnographic research is often referred to as cultural ethnography or cultural anthropology (Sharma & Sarkar, 2019).

iii) Grounded theory:

Grounded theory is a research methodology focused on the development of theory that is based in methodically acquired and examined facts. It is utilised to reveal aspects such as social connections and collective behaviours, referred to as social processes (Noble & Mitchell, 2016).

iv) Phenomenology:

Phenomenology is the study of events from the point of view of those who are experiencing them in the real world. It tries to find the essence of human experiences behind a phenomenon (Dangal, 2020).

In this study, the case study design method was used. According to McMillan and Schumacher (1993:479), qualitative research is defined as "primarily an inductive process of organising data into categories and identifying patterns (relationships) among the categories". Design of qualitative research is likely the most workable of the various experimental techniques, enclosing a variety of accepted methods and structures (Merriam, 1998).

3.5 Target population, Sampling Strategy and Sample Size

Majid (2018:3) defines a target population as an interest group that the study is focused on and from which samples are to be taken. In this study, the targeted population consisted of all departmental officials of under-resourced school in the Northern Cape. A sample of seven people were selected in the study. The participants in the study were selected following convenience and purposive sample.

Participants are selected for a purposeful sampling strategy, according to their level of knowledge and the amount of data they can supply on the topic of the study (Etikan *et al*., 2016:2).

For convenience sampling, a researcher selects simple activities depending on the accessibility and willingness of research participants - in the case of a human sample - as well as the availability of a convenience sampling strategy (Etikan et al., 2016).

The study conveniently sampled two schools within proximity as the case of the under-resourced schools in the Northern Cape. This is because convenience sampling allowed the researcher to select units to be sampled based on knowledge and professional judgment. This technique was also useful when the researcher had a limited budget, time, and workforce (Taherdoost, 2018). The research study sample size consisted of seven participants drawn from the District Director and Head of Infrastructure, along with principals from the under-resourced schools.

The study purposively sampled two District Directors, one Infrastructure Director in the Provincial office, as well as one official from DBSA and one official from IDC of the sampled under-resourced schools in the Northern Cape. The study also sampled two principals with at least five or more consecutive years in their role, and these were included in the research population.

The sample population was selected based on the direct involvement and expertise of the District Director, Head of Infrastructure, and principals from under-resourced schools in the research topic. These individuals are instrumental in financing, strategising, executing, and engaging with infrastructure development projects in underfunded schools. Each group offers distinct and supplementary perspectives, as detailed below.

District Directors supervise the execution of educational policies and are directly engaged in coordinating infrastructure initiatives and funding distribution at the district level. Their contributions offer a comprehensive insight into systemic challenges and opportunities.

The Head of Infrastructure offers technical expertise regarding infrastructure development and maintenance, providing insights into the planning, execution, and challenges associated with project implementation in educational institutions.

Principals - as primary stakeholders in educational institutions - directly perceive the effects of infrastructure development on teaching and learning. Their viewpoints guarantee that the study reflects the actual experiences of individuals impacted by funding and development initiatives.

3.6 Research Strategy

To collect data, researchers use different strategies. According to Saunders *et al*. (2016:60), a research strategy is a plan that outlines how the researcher intends to solve research concerns. It is a rigorous technique that incorporates the important results of the inquiry.

3.6.1 Case Study

Yin (2017) defines a case study as an investigation that centres on comprehending an organisation or a topic of interest. Data on recurring events inside an organisation and their contextual background are gathered for the study. A case study may also be seen as a thorough examination of the factors contributing to the characteristics being studied to generate new ideas and solutions via the development of underlying theories (Sekaran & Bougie, 2013).

3.6.2 Observations

Observation is the collection of data by a researcher using the senses (Groupson-Paul, 2009). This is a hands-on type of research involving participation in the lives of the study participants to derive an unopinionated and unbiased understanding of the social phenomenon involved.

3.6.3 Interviews

Interviews consist of exploratory, goal-driven inquiries with open-ended responses. They are employed when the research problem is not clearly stated. The interview technique is most utilised when the goal is to do deep and thorough study. This aids in greater explanation, comprehension, and exploration of viewpoints. They are utilised when the researcher wishes to learn about the respondent's sentiments, behaviour, preferences, attitude, knowledge, and opinions (Weatherall, 2019).

This is a face-to-face conversation with one or more respondents. Group interviews are useful when the study wants people to open up about personal or private matters.

The study used both interviews and observations to gather information from the research participants.

3.6.4 Data Collection Instrument

Data for this study was collected using a semi-structured questionnaire, which served as the primary data collection instrument. Although the study is qualitative in nature, the semi-structured questionnaire was chosen over an interview guide due to its ability to combine structured questions with open-ended prompts. This design allowed respondents to provide detailed descriptions and share their experiences in relation to the variable of interest. As noted by Nyathi (2021), semi-structured questionnaires are particularly effective in qualitative research for eliciting rich, in-depth data while maintaining consistency across participants.

Data for this study was collected by use of an interview guide. The face-to-face interviews were helpful in determining detailed opinions and the attitudes of research participants. According to Hair *et al*. (2011), the study objectives and the nature of the study determine the amount of data to be collected. Data can be collected either from primary sources or secondary sources. Primary data is collected for the first time by the researcher as part of the study. Interviews and observations are commonly used in qualitative studies. The interview method was used in this study, as it enabled the field worker to solicit information by asking respondents questions. The study employed semi-structured interview questions, allowing the researcher to be guided and not dictated by the schedule. This method allowed respondents to speak of their experiences instead of answering pre-determined hypothesis questions. The ethical clearance for this research was approved on 30 April 2024, ensuring that all study protocols adhered to ethical guidelines. The interviews were conducted over a period from 7 May 2024 to 28 June 2024, allowing sufficient time to gather in-depth insights from all selected participants.

3.7 Data Analysis

There are various methods of analysing qualitative data. The analytic approach of a researcher depends on a composition of factors, such as the research questions asked, the theoretical basis of the study, and the suitability of the process to make sense of the data (amongst others) (Kawulich, 2004).

3.7.1 Thematic Analysis

Braun and Clarke (2006) stated that thematic analysis is aimed at tracing out lawful and stable relationships between social phenomena, based on the regularities and sequences that connect

these phenomena. The following are the five stages of thematic analysis according to Braun and Clarke (2006):

i) Stage 1: familiarisation with the data to identify meaning units for coding. It can lead to identification of several (50 to 100);
ii) Stage 2: cross-checking the codes identified with Relationship Quotients, leading to chunking and reducing initial codes to manageable numbers (Braun & Clarke, 2006);
iii) Stage 3: this stage involves the clustering and grouping of related codes (Braun & Clarke, 2006);
iv) Stage 4: the expression of underlying means (latent content) linking the identified categories (Braun & Clarke, 2006); and
v) Stage 5: Telling the story and making sense of the data for others (Braun & Clarke, 2006, p. 87).

Framework Analysis was chosen for this study due to its structured and transparent approach, which is particularly suited for applied research with specific objectives. Framework analysis provides investigators with a well-defined structure for handling data, while also offering the flexibility inherent in qualitative research (Goldsmith, 2021). Unlike other methods, such as Thematic Analysis, it allows for a matrix-based organisation of data that facilitates both inductive and deductive coding. This framework consists of four stages:

i) matching the research question for the study with the interview questions;
ii) creating an inquiry-based approach that strikes a balance between inquiry and conversation to make the interviewee feel at ease;
iii) getting feedback on the interview protocols; and
iv) testing the interview protocols on a small sample of interviewees to improve the approach (Castillo-Montoya, 2016).

However, in the initial discussion, the mapping and interpretation stage of the Framework Analysis process was inadvertently omitted. This stage is crucial for identifying patterns, relationships, and themes in the data, as well as for interpreting findings in light of the study's research objectives.

3.8 Trustworthiness

Although there are differences in establishing trustworthiness in qualitative research, there is general agreement about the kinds of things that need to be made transparent when conducting a trustworthy qualitative study. Trustworthiness is the act of establishing four key principles to determine the quality of a qualitative research study (Stahl & King, 2020). Below, the notions of credibility, transferability, confirmability, and dependability are explained, along with their corresponding quantitative equivalents:

i) Credibility:

This refers to the degree of congruence between the findings and actuality. This question is subjective and contingent upon individual assessments, as already stated. Assessing the coherence of results in qualitative research is akin to examining the internal validity in quantitative research. The goal is to understand the logical consistency of the findings, namely how the ideas are interconnected and related to each other. Unlike quantitative research, coherence credibility does not assume that all responses yield similar conclusions. Credibility is a subjective perception that is determined by the reporter(s) and then perceived by the subsequent reader(s) (Stahl & King, 2020).

ii) Transferability:

This determines whether research findings can be applied to people and conditions other than those on which the study was conducted and may include generalisation of the study's results. In this study, the concept of transferability was met through a description of the research setting and the basic assumptions. Specifically, the meaning of the latter assumes judgmental sampling. Hereby, it was necessary to achieve the possibility of transferring the research findings to a different yet similar setting.

iii) Confirmability:

According to Lincoln and Guba (1985), quantitative research does not require general objectivity, but rather the researcher's neutrality in interpreting the research findings. According to Patton (2002), confirmability refers to the assurance that the research findings are derived only from the participants' responses and are not influenced by any potential bias or personal objectives of the researcher. To assure confirmability in this investigation, all methods were well documented and emphasised. In addition, a comprehensive explanation of all stages of

data analysis was provided to justify the judgements made, allowing for the tracking and assessment of data throughout the research study.

iv) Dependability:

This refers to the extent and consistency with which other researchers can replicate study findings. According to Naeem and Ozuem (2021), dependability refers to the ability of either the participants or researchers to assess the suggestions and interpretation of the qualitative findings, which should be consistent and reliable throughout time.

3.9 Conclusion

This Chapter explained the methodology, research design, sample strategy, data collection tool, data validation procedure, and data analysis strategy chosen for the study, as well as how they were implemented. The following Chapter will go into detail about the findings from the primary data analysis. The results of the study will be presented and explained in the following Chapter.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This Chapter aims to examine and analyse the findings of the data analysis. The results are analysed, assessed, and linked to the preceding material covered in Chapter Two. All replies from interviewees are quoted verbatim to accurately showcase their subjective insights. This is done to guarantee that comments can be understood in an unbiased manner, thereby confirming their authenticity. The study aimed to determine whether the allocation of funds for infrastructure development by DFIs, such as the DBSA and the IDC, has led to improved outcomes and socio-economic advancement in under-resourced schools in the Northern Cape Province of South Africa.

If not, the study also sought to identify the reasons behind this lack of progress.

4.2 Sample Demographics

This section presents demographic information about the seven selected research participants. The study's results are presented in subsections categorised by the participants' age, gender, nature of the institution, years of experience, and current role in the institution.

The age distribution of the research participants revealed a predominance of older participants, with the most frequent age being 57 years, represented by three individuals. This indicated a skew towards more experienced individuals, possibly with extensive backgrounds in their respective fields. There is an even representation of individuals aged 34, 57, 51, and 53, each with one participant. This diverse age range suggested a mix of perspectives, blending both relatively newer and more seasoned viewpoints. However, the concentration of participants in the higher age bracket could imply a greater weight of insights from those with substantial professional experience.

The gender distribution of the respondents showed a slight male majority, with four males compared to three females. This near equilibrium suggests a relatively balanced representation of perspectives from both genders. The close ratio may provide a well-rounded view of the issues under investigation, potentially capturing diverse insights and experiences. The slight male predominance might indicate marginally higher participation or availability of males in

the context of this study. Overall, the gender distribution is balanced, allowing for comprehensive analysis across gender lines.

The nature of the institutions represented by the participants was diverse, including one from a primary school, one from a high school, one from a DoE district, two from the DoE, one from the IDC, and the last one from the DBSA. This variety ensured a comprehensive analysis, capturing detailed insights from different educational levels and strategic perspectives from both regional and national education departments, as well as DFIs.

The participants' years of experience, ranging from 11 to 30 years, ensured a well-rounded perspective, with three participants in the 11 to 19-year range, two in the 27 to 28-year range, one with 25 years, and the remaining participant with 30 years of experience. This distribution provided a balance of mid-career insights and extensive professional knowledge, contributing to a comprehensive analysis of the educational and infrastructure development sectors.

The current roles of the participants highlighted a mix of leadership and specialised positions, including one Director, two District Directors, two Principals, one Knowledge Management Specialist, and one Product Implementation Specialist. This diversity ensured a comprehensive analysis, with strategic and operational insights from top management, practical perspectives from school principals, and specialised knowledge in knowledge management and product implementation, covering both educational administration and technical implementation aspects.

Table 7 provides a breakdown of the participants:

Table 7

Interviewed participants

Participant ID	Age	Gender	Nature of Business	Years of Experience	Current Role	Date of Data Collection	Interview Duration
Participant 1	34	Female	Provincial Department of Education	11	Director	2024/05/07	12:00-12:45
Participant 2	57	Male	NCDOE Pixley Ka Seme District office	30	District Director	2024/05/07	17:00-17:50
Participant 3	51	Female	Zingisani Primary school	25	Principal	28/06/2024	10:00-10:55
Participant 4	57	Male	Department of Education	25	ZF District Director	03/06/2024	9:00-9:50
Participant 5	53	Male	Monwabisi High School	19	Principal	07/06/2024	13:00-13:50
Participant 6	57	Male	DBSA	28	Product Implementation Specialist	23/05/2024	14:00-14:40
Participant 7	37	Female	IDC	17	Product Implementation Specialist	27/05/2024	9:00-9:30

Source: Author, 2024

4.3 Thematic Findings

This section focuses on the discussion of the major themes extracted from the analysis of the primary data. The thematic analysis provides a comprehensive understanding of the role of DFI-funded infrastructure development on under-resourced schools, capturing the multifaceted experiences and insights of the participants. The roles of DFI-funded infrastructure development on under-resourced schools includes the impact on physical learning environment, access to educational materials, and future requirements. These are presented in Table 8 with the corresponding subthemes. The discussion of themes and sub-themes are covered in sections 4.3.1 to 4.3.3.

Table 8

Themes and Sub-themes

Themes	Sub-Themes
4.3.1 Impact on Physical Learning Environment	4.3.1.1 Technology Integration
	4.3.1.2 Improved Accessibility
	4.3.1.3 Student Engagement
4.3.2 Access to Educational Materials	4.3.2.1 Improved Resources
	4.3.2.2 Community Resources
	4.3.2.3 Maintenance and Sustainability
4.3.3 Future Requirements	4.3.3.1 Continued Investment
	4.3.3.2 Supplementary Revenue
	4.3.3.3 Additional Resources

Source: Author, 2024

4.3.1 Impact on Physical Learning Environment

The first role of DFI-funded infrastructure development on under-resourced schools is the impact of the physical learning environment. The substantial role is reflected through the EIG, which established new schools, replaced old structures, and conducted maintenance. Three subthemes emerged from this theme, namely technology integration, improved accessibility, and student engagement.

4.3.1.1 Technology Integration

Technology Integration emerged as one of the key ways in which the infrastructure development sponsored by DFIs enhanced the physical learning environment in schools, according to multiple participants.

As Participant 3 stated:

> *Most of the investments by DFIs accept the utilisation of advanced ICTs that provide a wealth of the latest resources in the educational environment.*

This is in line with what Seobi and Wood (2016) highlighted: that these include interactive whiteboards, computer labs, and high-speed internet connectivity, and all these features have enhanced both the teaching and learning experiences.

Similarly, Participant 1 highlighted:

> *DFI funded reliable internet connectivity that improved the capacity of students and teachers to use online resources, research materials, and collaborative tools.*

This shows that the establishment of smart classrooms - equipped with interactive whiteboards, projectors, and other cutting-edge technologies - has empowered teachers to leverage sophisticated tools for teaching, thereby creating more engaging and captivating learning experiences for students. As Martin *et al*. (2007) previously stated: in many under-resourced schools in South Africa, learners are failing to meet the required academic standards.

4.3.1.2 Improved Accessibility

The second sub-theme under the physical learning environment was Improved Accessibility. This emerged as another significant way in which the DFI-funded infrastructure development enhanced the physical learning environment in schools. Several participants highlighted the improvements made to cater to students with disabilities and special needs.

As stated by Participant 7:

> *Infrastructure projects financed and constructed with support from DFIs typically have improved the school premises to suit students with disabilities better. This includes measures such as installing ramps, elevators, and accessible washrooms, among other features that ensure increased accessibility.*

This is inconsistent with Baah-Boateng (2021), who argued that there was a lack of innovative human capital development programs in many African nations.

The infrastructure projects sponsored by DFIs prioritised improving accessibility by incorporating features like ramps, elevators, and accessible washrooms, making the school premises more inclusive and accommodating for students with disabilities or mobility challenges.

Participant 4 provided further insights on the impact of improved accessibility by asserting that:

> *Students find better infrastructure attractive due to its inclusive design, which ensures accessibility for learners with physical barriers, such as those who use wheelchairs. This*

includes providing access to ablution facilities and classrooms, which is particularly exciting for them.

As Participant 1 mentioned:

Upgraded libraries and resource centres equipped with digital and print materials have offered students a quiet and resource-rich environment for study and research.

This is in line with what Larsson and Löwstedt (2023) asserted: improved accessibility was not only about physical infrastructure but also extended to educational resources.

4.3.1.3 Student Engagement

Student Engagement emerged as a key area that was positively impacted by the DFI-funded infrastructure development in schools. Multiple participants noted an increase in student participation and engagement with class activities and learning materials, due to the upgraded facilities and incorporation of interactive technologies.

As stated by Participant 1:

Contemporary classrooms have frequently promoted more engagement between educators and learners. Teachers can freely navigate the classroom and engage with students on an individual or small group basis, offering a higher level of personalised attention and support.

This claim is supported by Spillane *et al*. (2015), who argued that the contemporary classrooms, enabled by DFI funding, fostered a more engaging learning environment where teachers could move around freely, interacting with students on an individual or small group level, providing personalised attention and support, thereby enhancing student engagement.

Participant 7 highlighted the role of interactive technologies in boosting student engagement:

…contemporary classrooms that are furnished with interactive technologies, such as smart boards and multimedia projectors, enhance the level of engagement in lessons. Students are more inclined to engage actively when lessons incorporate interactive elements and visually captivating stimuli.

This is supported by Mupa and Chinooneka (2015), who argued that physical infrastructures will have an impact if they prevent work from being done.

Furthermore, Participant 6 noted the adoption of active learning techniques by teachers:

> *Teachers are more inclined to integrate active learning methodologies, such as collaborative discussions, interactive simulations, and practical exercises, into their instructional sessions. These strategies effectively engage pupils more than standard lecture-based education.*

This is similar to the views of Larsson and Löwstedt (2023), who asserted that education, if of quality, must equip students with skills that ensure they can further the goals of education and become productive members of society.

4.3.2 Access to Educational Materials

Improved access to educational materials supports a dynamic learning environment that prepares students for the challenges of the modern world, while promoting equity and innovation in education. The study identified three subthemes concerning access to educational materials: improved resources, community resources, and maintenance and sustainability.

4.3.2.1 Improved Resources

Improved access to educational materials can significantly benefit students and educators alike. With modern resources and dedicated budgets for textbooks and supplementary materials, educational institutions can ensure that students have access to up-to-date information and diverse learning resources. Here are some key points which were discussed by the participants:

Participant 4 stated that:

> *DFIs have provided funding for the establishment of computer laboratories. This has fostered increased availability of digital learning tools, educational software, and online venues.*

Participant 5 also mentioned:

> *DFIs have also aided with the acquisition and dissemination of current textbooks and other necessary educational materials.*

This is supported by du Plessis and Mestry (2019), who highlighted the importance of providing learners with basic supplies like stationery and cleaning supplies.

This is also supported by Chingos *et al*. (2010), who contended that an essential component of better training is the calibre of learning resources, such as textbooks. The participants highlighted that lack of educational resources in under-resourced schools sometimes hampers teaching and learning. They also alluded that - despite financial incentives - good teachers usually prefer to teach in well-resourced schools. Similarly, a study by du Plessis and Mestry (2019) asserted that - without good textbooks or classroom resources - more teachers cannot necessarily improve the quality of education.

4.3.2.2 Community Resources

Community resources are an important resource in improving access to education; based on the study's primary data, the DFI-funded infrastructure development has also benefited the local communities surrounding the schools in several ways.

As mentioned by Participant 2:

> *Contemporary educational establishments frequently incorporate upgraded sanitation, provision of uncontaminated water, and healthier surroundings, all of which have a beneficial influence on the health and welfare of both students and staff, with subsequent good impacts extending to the community.*

The upgraded infrastructure, including improved sanitation, access to clean water, and healthier surroundings, not only benefits the students and staff but also positively impacts the broader community's health and well-being.

Participant 5 stated:

> *Infrastructure development has had several positive effects on the neighbourhood in terms of job creation throughout the construction stages. Beyond benefiting the school community, improved facilities serve as a valuable resource for the broader community, offering access to educational and recreational opportunities.*

Additionally, the improved facilities serve as valuable resources for the broader community, providing access to educational and recreational opportunities. The DoE advised that all

provincial departments need to ensure that all schools are well-sourced with ICTs for implementation of e-education curricula (Khumalo & Mji, 2014).

Participant 7 further mentioned:

> *Additionally, the upgraded school infrastructure enhances the overall appeal and image of the neighbourhood, potentially attracting investment and contributing to local economic development.*

This is supported by Seobi and Wood (2016), who argued that adequate resourcing of schools, including ensuring the provision of ICTs, is key for successful implementation of educational initiatives and improved educational outcomes.

4.3.2.3 Maintenance and Sustainability

The research data highlights Maintenance and Sustainability as a key concern, despite the advancements in infrastructure development funded by DFIs. Here are some relevant quotes and discussions on this issue.

Participant 5 raised this concern:

> *Despite the advancements in infrastructure, one primary concern that remains is the ongoing maintenance and sustainability of the facilities. Ensuring that the infrastructure remains in good condition over the long term requires dedicated resources and proactive management strategies.*

The participant emphasised that - while the infrastructure improvements are significant - ensuring the long-term maintenance and sustainability of these facilities is a primary concern. It requires dedicated resources and proactive strategies to maintain the infrastructure in good condition over time.

Participant 1 also mentioned:

> *Despite the advancements in infrastructure, one primary concern that remains is the ongoing maintenance and sustainability of the facilities. If there is not enough financing and proper planning for continuous maintenance, the condition of the infrastructure could decline.*

The DoE also supported that adequate budgetary allocation is essential for maintaining educational infrastructure. like ICT facilities in school libraries (Khumalo & Mji, 2014).

Similar to the previous participant, this quote highlighted the need for adequate financing and proper planning for continuous maintenance to prevent the decline of the infrastructure's condition. This is supported by Singh (2008), who highlighted that insufficient funding has forced communities to contribute financially to essential school needs (like maintenance).

4.3.3 Future Requirements

Addressing future requirements for educational materials and resources necessitates a balanced approach to investment and the management of challenges such as maintenance, vandalism, and budget constraints. Three subthemes emerged under this theme, namely: continued investment, supplementary revenue, and additional resources.

4.3.3.1 Continued Investment

The research data highlighted various aspects of infrastructure development impacts, from physical improvements and educational materials to community effects and future needs.

Participant 3 noted:

> *These improvements collectively helped to establish a learning environment that is more favourable, inclusive, and dynamic. As a result, we have seen better educational outcomes and more opportunities.*

This aligns with Larsson and Löwstedt (2023), who defined educational infrastructure as the aspect of the school system that is intended to support, coordinate, and maintain teachers' instructional practice and promote efforts to improve that practice.

Participant 6 expressed the following:

> *Continued investment in upgrading and additional supply of infrastructure is required; however, due to the maintenance burden of existing schools, the state of vandalism and the current budget pressures the backlog continues to increase annually.*

Khumalo and Mji (2014) agreed with this, as it was highlighted that an adequate budget from the Norms and Standards grant is essential for the procurement, acquisition, and maintenance of the ICTs in library facilities at schools.

Participant 2 commented:

> *…continued investment in our school yielded various advantages for the local community, including economic growth, improved safety, strengthened community solidarity, and expanded access to resources.*

Supporting this, Maqoqa and Mvenene (2023) highlighted that school infrastructure has a significant impact on the quality of education and is one of the most influential factors when considering increasing academic performance.

4.3.3.2 Supplementary Revenue

Supplementary Revenue plays a critical role in improving educational quality, maintaining infrastructure, and offering programs and services that directly benefit students, teachers, and the wider community. DBSA (2023) highlighted that this, in turn, promotes social and economic development in the Southern African region. Despite infrastructure progress, the research participants emphasised ongoing concerns related to supplementary revenue.

Participant 5 emphasised the importance of securing long-term funding for the continuous maintenance and preservation of school buildings to uphold infrastructure standards and prevent deterioration. In support of this view, van Dyk and White (2019) added that equitable funding of public schools was required to reduce the disparities in education.

Participant 7 highlighted that:

> *our school generates significant supplementary income by renting out the gymnasium for local sports events and community gatherings during weekends.*

Furthermore, participant 3 pointed out that:

> *revenue from the cafeteria and vending machines supports extracurricular activities and after-school programs.*

This information highlighted the tangible impact of these financial resources and the importance of sustaining them.

4.3.3.3 Additional Resources

Additional resources play a crucial role in enriching the educational experience for both students and teachers. Therefore, schools must prioritise the long-term sustainability of these resources, ensuring consistent and reliable funding and support.

Participant 3 emphasised:

> *While grants and donations are helpful, it's essential to establish sustainable funding sources to maintain our programs.*

Additionally, it was suggested that schools focus on integrating and utilising these additional resources. This is similar to what Pillay (1999) alluded to, in that the education budget was barely sufficient to maintain the existing infrastructure.

Participant 5 pointed out:

> *Proper training for teachers on how to effectively use new technology is vital for its successful integration into the classroom.*

Similarly, Mehta and Fine (2015) highlighted that teacher training enabled schools to enact their visions.

4.4 Discussion of Findings

The data analysis and study addressed all the relevant parties involved in DFI funding and infrastructure development in South Africa. The main emphasis was on schools that lacked adequate funding.

4.4.1 Impact on Physical Learning Environment

The study clearly highlighted that DFIs have a complex impact on the physical learning environment in South Africa, as they address several issues such as the structure and materials of educational facilities, as well as safety, inclusivity, sustainability, and community engagement. DFIs can enhance the quality of education, promote favourable learning outcomes,

and contribute to wider socio-economic development by making strategic investments in educational infrastructure.

4.4.2 Access to Educational Materials

The study also identified that DFIs play a crucial role in enhancing the availability of educational resources in South Africa. DFIs may greatly improve the quality and fairness of education by providing financial support for both traditional and digital learning materials, increasing diversity, addressing inequalities, and building partnerships. These endeavours not only enhance immediate educational results but also contribute to the long-term advancement and socio-economic prosperity of the nation.

4.4.3 Future Requirements

The study identified the future demands for DFIs to improve the physical learning environment - and ensure access to educational materials in South Africa - as revolving around sustainability, the integration of technology, equity, and collaboration. DFIs may assure the responsiveness of their investments to the changing demands of the education sector and their contribution to the long-term development of education and socio-economic conditions in the country by concentrating on these areas.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The preceding Chapter discussed the findings of the study on the impact of DFIs infrastructure investments in under-resourced schools in the Northern Cape Province of South Africa. This Chapter brings the study to a close by summarising the main arguments presented and offering recommendations based on the findings. It revisits the key points discussed throughout the study, synthesising the critical insights, and concluding. Furthermore, this Chapter aims to provide practical recommendations that can inform future research, policy-making, or practical applications relevant to the study's focus.

5.2 Summary and Conclusions

The research findings revealed that the EIG significantly improved the physical learning environment in schools, primarily through technology integration, improved accessibility, and enhanced student engagement. Technology integration, supported by DFIs, introduced advanced ICTs like interactive whiteboards, computer labs, and high-speed internet, enriching teaching and learning experiences. Improved accessibility was achieved by incorporating features like ramps, elevators, and accessible washrooms, making schools more inclusive for students with disabilities. Upgraded libraries and resource centres also provided resource-rich environments for study and research. Additionally, these infrastructure enhancements fostered greater student engagement. Contemporary classrooms equipped with interactive technologies promoted active participation and personalised attention from teachers. These improvements encouraged the adoption of active learning techniques, such as collaborative discussions and interactive simulations, further engaging students and enhancing their educational experiences.

5.2.1 Findings from Theme 2: Access to Educational Materials

The study revealed that improved access to educational materials significantly enhanced the learning environment, promoting equity and innovation. DFIs have facilitated the provision of modern resources such as computer labs, digital learning tools, and current textbooks, which enrich educational experiences for both students and educators. Community resources have also been positively impacted, with upgraded infrastructure improving sanitation, access to clean water, and healthier surroundings, benefiting both the school and the local community. These developments have also generated job opportunities and contributed to local economic

development. However, maintenance and sustainability of the new infrastructure remain a critical concern. Participants highlighted the necessity for dedicated resources and proactive management strategies to ensure long-term upkeep and functionality of the facilities, underscoring the importance of adequate financing and planning to prevent infrastructure deterioration.

5.2.2 Findings from Theme 3: Future Requirements

The research identified future requirements for educational materials and resources, highlighting the need for continued investment, supplementary revenue, and additional resources. Continued investment is crucial to maintaining and enhancing the learning environment, although challenges such as maintenance burdens, vandalism, and budget pressures persist. Participants emphasised that ongoing investment not only improves educational outcomes but also benefits the broader community by promoting economic growth and safety. Supplementary revenue is vital for sustaining infrastructure and educational programs, with participants noting the importance of generating income through renting facilities and other initiatives. This supplementary income supports extracurricular activities and helps maintain infrastructure standards. Additionally, securing sustainable funding sources - and providing proper training for teachers to utilise new technologies effectively - is essential for the successful integration and long-term sustainability of additional resources. This holistic approach ensures a dynamic and inclusive learning environment that prepares students for future challenges.

5.3 Conclusions

This section presents the conclusions of the study based on the themes of the study.

5.3.1 Conclusions from Theme 1: Impact on Physical Learning Environment

In conclusion, the EIG has profoundly transformed the physical learning environment in schools by facilitating significant advancements in technology integration, accessibility, and student engagement. The support from DFIs has enabled the introduction of advanced ICTs, such as interactive whiteboards and high-speed internet, which have enriched both teaching and learning experiences. The inclusion of accessibility features like ramps and elevators has made schools more inclusive for students with disabilities, while upgraded libraries and resource centres have created resource-rich environments for study and research. Furthermore, the

infrastructure improvements have fostered a more engaging and dynamic educational experience, encouraging active learning through collaborative discussions and interactive simulations. These enhancements collectively contribute to better educational outcomes and a more inclusive, supportive, and stimulating learning environment.

5.3.2 Conclusions from Theme 2: Access to Educational Materials

In conclusion, the study underscored the transformative impact of improved access to educational materials and upgraded infrastructure on the learning environment and community well-being. DFIs have played a crucial role in enhancing educational experiences through the provision of modern resources like computer labs and digital learning tools, fostering equity and innovation in education. The positive ripple effects extend beyond the classroom, as upgraded infrastructure supports improved sanitation, access to clean water, and healthier environments, benefiting not only students and educators but also the broader community. Despite these advancements, challenges such as maintenance and sustainability persist, necessitating ongoing investment and proactive management strategies. Ensuring adequate financing and planning are essential to uphold the functionality and longevity of infrastructure developments, thereby safeguarding their continued benefits for education and local economic development.

5.3.3 Conclusions from Theme 3: Future Requirements

In conclusion, the research underscored the necessity for sustained investment, supplementary revenue, and additional resources to meet future educational requirements. Continued investment is vital for maintaining and enhancing the learning environment, despite challenges such as maintenance, vandalism, and budget constraints. Such investment not only improves educational outcomes but also benefits the broader community by fostering economic growth and safety. Generating supplementary revenue through initiatives like renting facilities is essential for sustaining infrastructure and supporting extracurricular activities. Ensuring long-term sustainability requires establishing reliable funding sources and providing proper training for teachers to effectively utilise new technologies. This comprehensive approach promotes a dynamic and inclusive learning environment, equipping students to meet future challenges and enhancing overall educational quality and community well-being.

5.4 Recommendations

Based on the findings of this study, the following recommendations are proposed to further enhance the educational environment and address identified challenges:

i) Continued Investment in Infrastructure:

- Secure and allocate dedicated funding for ongoing infrastructure development to ensure continuous improvement and maintenance of school facilities; and
- Prioritise projects that incorporate advanced technologies, accessibility features, and modern learning environments to foster inclusive and dynamic educational experiences.

ii) Development of Sustainable Funding Models:

- Establish reliable and sustainable funding sources, such as partnerships with private sector entities and government grants, to support long-term infrastructure maintenance and development; and
- Encourage schools to generate supplementary revenue through renting facilities for community events, providing services, and leveraging other income-generating initiatives.

iii) Monitoring and Evaluation:

- Establish robust monitoring and evaluation mechanisms to assess the effectiveness of infrastructure investments and educational resource provisions; and
- Use feedback from students, educators, and community members to inform future planning and ensure continuous improvement.

5.5 Areas of Further Research

Based on the findings and limitations of this study, the following areas are recommended for further research:

- Conduct comparative studies between different regions or countries to analyse how variations in infrastructure investments and resource allocation impact educational quality and equity; and

- Investigate the long-term effects of infrastructure investments on educational outcomes, community development, and economic growth to understand the sustained benefits and potential areas for improvement.

5.6 Final Conclusions

The research was divided into five Chapters, each addressing different aspects of the study to provide a comprehensive understanding of the challenges affecting educational infrastructure and resource provision. The initial Chapters outlined the study's background, reviewed existing literature on the topic, and detailed the methodology employed. This was followed by an in-depth analysis of primary data, highlighting significant findings regarding the impact of infrastructure investments on the educational environment.

The study revealed that the EIG has significantly improved the physical learning environment in schools through technology integration, enhanced accessibility, and increased student engagement. Additionally, the provision of modern resources and upgraded infrastructure has positively impacted both the educational experiences of students and the well-being of local communities. However, the research also identified critical challenges, including the need for ongoing maintenance, sustainable funding, and proactive management strategies to ensure the long-term viability of these improvements.

This final Chapter served as a culmination of the study, presenting targeted recommendations to address the identified challenges and suggesting areas for further research. By synthesising data from both primary and secondary sources, the study offers a holistic view of the current state of educational infrastructure and provides actionable insights for future improvements.

Through continued investment, strategic management, and community engagement, stakeholders can create a more dynamic, inclusive, and sustainable educational environment that meets the evolving needs of students and communities.

REFERENCES

African Development Bank. (2020). *Kenya: Support to Technical and Vocational Education and Training (TVET) and Entrepreneurship*. https://www.afdb.org

Alhassan, A. L. (2023). Development finance: A conceptual definition. *Development Finance Agenda, 8*(5), 16–18.

Archer, A. L., & Hughes, C. A. (2011). *Explicit instruction: Effective and Efficient Teaching*. Guilford Press.

Arroyo, Y.P.V., Niebles, R.P., & Correa, C.B (2023). Influence of environmental conditions on students' learning processes: A systematic review. *Building and Environment, 231*, 110051–110051. https://doi.org/10.1016/j.buildenv.2023.110051

Attridge, S. and C. Novak (2022). *An Exploration of Bilateral Development Finance Institutions' Business Models*. London, ODI.

Baah-Boateng, W. (2013). *Human Capital Development: The Case of Education as a Vehicle for Africa's Economic Transformation*. MPRA Paper No. 109692. 12(109692), 48.

Barnard, A. (2016). *The Impact of Development Finance Institutions on Socio-economic Transformation: the case of South Africa*. A research report submitted in partial fulfilment of the requirements for the degree of Master of Management the Faculty of Commerce, Law and Management, University of the Witwatersrand, Johannesburg.

Barrett, P., Treves, A., Shmis, T., Ambasz, D., & Ustinova, M. (2019). *The Impact of School Infrastructure on Learning: A Synthesis of Evidence*. Washington, DC: World Bank. https://doi.org/10.1596/978-1-4648-1378-8

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice, 5*(1), 7-74.

Borensztein, E., De Gregorio, J., & Lee, J. W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics, 45*(1), 115–135. https://doi.org/10.1016/S0022-1996(97)00033-0

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2). pp. 77-101.

Burge, L.,Van Coppenollle, M., and Blagborough, C. (2024). *The Role of Development Finance Institutions in Accelerating the Mobilisation of Green Capital*. Climate Bonds Initiative.

Carter, P., Van de Sijpe, N., and Calel, R. (2021). The elusive quest for additionality.*World Development, 141*, 105393

Chen, M. (2020). Beyond Donation: China's Policy Banks and the Reshaping of Development Finance. Studies in Comparative International Development 55(4): 436-459.

Chikoko, V., & Mthembu, P. (2020). Financing primary and secondary education in sub-Saharan Africa: A systematic review of literature. *South African Journal of Education, 40*(4), 1–9. https://doi.org/10.15700/saje.v40n4a2046

Chingos, M. M., Henderson, M., West, M. R., & Harvard University, P. on E. P. and G. (2010). *Citizen Perceptions of Government Service Quality: Evidence from Public Schools*. Program on Education Policy and Governance Working Papers Series. PEPG 10-16. Program on Education Policy and Governance, Harvard University. https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=eric&AN=ED513538&site=ehost-live&scope=site&custid=s8454451

Coombs, H. (2022). Case study research Defined (White Paper). *Psychoanalysis Online, 4*(September 2022), 49–59. https://doi.org/10.5281/zenodo.7604301

Dangal, M. R. (2020). Phenomenology, Case Study and Grounded Theory in Educational Research. *Education and Development, January 2009*.

Department of Basic Education. (2020). *Action Plan to 2024*. August 2020, 1–18.

Development Bank of Southern Africa. (2020). *Annual Report 2019/2020*. Development Bank of Southern Africa. https://www.dbsa.org

Development Bank of Southern Africa (2022). *Integrated Finance Report 2022*. https://www.dbsa.org/sites/default/files/media/documents/2022-08/DBSA%20Integrated%20Annual%20Report%202022.pdf

Development Bank of Southern Africa. (2023). *Infrastructure Investment in Education: Annual Review*. Midrand: DBSA.

Development Bank of Southern Africa. (2023). *Integrated Annual Report 2023*. DBSA.

DFI Working Group.(2021). *Blended Concessional Finance for Private Sector Projects*. Joint Report. December 2021 Update. https://www.eib.org/attachments/documents/mdb-dfi-working-group-blended-concessional-finance-private-sector-joint-reoprt-dec-2021.pdf

Donnelly, L. (2020). *The linchpin of SA's recovery plan is infrastructure, Cyril Ramaphosa says*. BusinessLIVE. https://www.businesslive.co.za/bd/economy/2020-10-15-the-linchpin-of-sas-recovery-plan-is-infrastructure-cyril-ramaphosa-says/

du Plessis, P., & Mestry, R. (2019). Teachers for rural schools; a challenge for South Africa. *South African Journal of Education, 39*(September), 1–9. https://doi.org/10.15700/saje.v39ns1a1774

ECCO. (2025). *What happened at COP29: the results of the Baku Conference of the Parties*. 10 January 2025. https://eccoclimate.org/what-happened-at-cop29-the-results-of-the-baku-conference-of-the-parties/

Education Endowment Foundation. (2021). *Sutton Trust-Education Endowment Foundation Teaching and Learning Toolkit*. https://educationendowmentfoundation.org.uk/education-evidence/teaching-learning-toolkit

Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review, 13*(1), 1-22.

Forster, W., Charnoz, O., Meliono, T. and Naudet, J. (2023). *Development Finance Institutions: New directions for the future*. Dans (dir.), 1 -68 . Éditions AFD. https://shs.cairn.info/journal-afd-research-papers-2024-298-page-1?lang=en.

Hamilton, L. S., Stecher, B. M., Klein, S. P., Linn, R. L., Nelson, J. S., & Zwiebach, K. (2009). *Using student achievement data to support instructional decision making*. Rand Corporation.

Industrial Development Corporation (2021). *Integrated Report 2020*. www.idc.co.za

Ingram, G., & Mosbacher, R. A. (2018). *Development finance: Filling today's funding gap*. Brookings, 1–6. https://www.brookings.edu/research/development-finance-filling-todays-funding-gap/

Jaya, A. K., Fithratullah, R., Kurniawati, K., & Utha, M. A. (2023). The Influence of Environmental Quality in Classrooms on Internal Response and Academic Performance in Conventional and Energy-Efficient Buildings. *Journal of Social Research, 2*(11), 4006–4019. https://doi.org/10.55324/josr.v2i11.1516

Kgomo, M. E. (2019). *DFI Funding and Infrastructure Development: A case of the Under-resourced Municipalities in South Africa*. A dissertation presented in partial fulfilment of the requirements for the Degree of Master of Commerce in Development Finance, University of Cape Town.

Khumalo, B., & Mji, A. (2014). Exploring educators' perceptions of the impact of poor infrastructure on learning and teaching in rural South African schools. *Mediterranean*

Journal of Social Sciences, 5(20), 1521–1532. https://doi.org/10.5901/mjss.2014.v5n20p1521

Kibuuka, P. & Shandu, N. (2020). The Determinants of Risk Exposure When Development Finance Institutions Consider Approval of Funding to Different Development Markets: Case Study Development Bank of Southern Africa. *Journal of Psychology Research, 10*(9), 359–381. https://doi.org/10.17265/2159-5542/2020.09.004

Kivunja, C. (2018). Distinguishing theory, theoretical framework, and conceptual framework: a systematic review of lessons from the field. *International Journal of Higher Education, 7*(6), 44-53

Larsson, P., & Löwstedt, J. (2023). Distributed school leadership: Making sense of the educational infrastructure. *Educational Management Administration and Leadership, 51*(1), 138–156. https://doi.org/10.1177/1741143220973668

Leo, B. and Moss, T. J. (2016). *Inside the Portfolio of the Overseas Private Investment Corporation*. Policy Papers 81, Center for Global Development.

Manqele. C. (2017). *An evaluation of learner-centred teaching as part of curriculum delivery in under-resourced schools*. University of South Africa, Pretoria. http://hdl.handle.net/10500/23198

Maqoqa, T., & Mvenene, J. (2023). Factors inhibiting effective quality learning and teaching: a case of five schools in the EC Province of South Africa. *International Journal of Research in Business and Social Science (2147- 4478), 12*(3), 474–482. https://doi.org/10.20525/ijrbs.v12i3.2387

Martin, M. O., Mullis, I. V. S., & Kennedy, A. M. (2007). *Progress in International Reading Literacy Study*. PIRLS 2006 Technical Report. In International Association for the Evaluation of Educational Achievement.

McLaren, D (n.d.). *Funding Basic Education*. Basic Education Rights Handbook. 2nd Edition, Chapter 2.

Mdodana-Zide, L. (2023). Teacher's Pedagogical Strategies in Under-Resourced Rural Schools in South Africa. *E-Journal of Humanities, Arts and Social Sciences, 4*(12), 20-31. 10.38159/ehass.20234123.

Mehta, J., & Fine, S. (2015). *The why, what, where, and how of deeper learning*. Students at the Center: Deeper Learning Research Series, December, 1–32.

http://www.jff.org/sites/default/files/publications/materials/The-Why-What-Where-How-121415.pdf

Mkwama, V. (2023). The Influence Of School Facilities On Student's Academic Achievement In Tanzania. *International Journal Of Research In Education Humanities And Commerce, 4*(5), 213–223. https://doi.org/10.37602/IJREHC.2023.4518

Mojapelo, S. M., & Durodolu, O. O. (2022). Information and communications technologies in library facilities in disadvantaged rural schools in South Africa: Lessons from Limpopo province. *Education for Information, 38*(2), 113–131. https://doi.org/10.3233/EFI-211541

Mupa, P., & Chinooneka, T. I. (2015). Factors contributing to ineffective teaching and learning in primary schools: Why are schools in decadence? *Journal of Education and Practice, 6*(19), 125–132.

Multilateral Development Banks and Development Finance Institutions Group (2019). *Joint Report on Private Finance Mobilization*. IFC.

Multilateral Development Banks and Development Finance Institutions Group. (2021). *Joint Report on Private Finance Mobilization*. IFC.

Murillo, F. J., & Román, M. (2011). School infrastructure and resources do matter: Analysis of the incidence of school resources on the performance of Latin American students. *School Effectiveness and School Improvement, 22*(1), 29–50. https://doi.org/10.1080/09243453.2010.543538

Naeem, M., & Ozuem, W. (2021). The role of social media in internet banking transition during COVID-19 pandemic: Using multiple methods and sources in qualitative research. *Journal of Retailing and Consumer Services, 60*(December 2020), 102483. https://doi.org/10.1016/j.jretconser.2021.102483

National Treasury. (2023). *Estimates of National Expenditure: Vote 16 - Basic Education*. Government of South Africa. https://www.treasury.gov.za

Nkondo, M., Brown, A., Dick, A., Hart, G., Molawa, S., Nassimbeni, M., Seleti, Y., & Teffo, L. J. (2014). *The Library and Information Services (LIS) Transformation Charter*. Commisioned by the Department of Arts and Culture.

Noble, H., & Mitchell, G. (2016). What is grounded theory? *Evidence-Based Nursing, 19*(2), 34–35. https://doi.org/10.1136/eb-2016-102306

Northern Cape Depertment of Education. (2018). *Standards Progress Report*. NCDoE. Commissioned by the Department of Arts and Culture (DAC) and the National Council for Library and Information Services (NCLIS). February.

Northern Cape Department of Education. (2022). *Report 2021/22*. NCDoE.

Northern Cape Department of Education. (2023). *Northern Cape No Fee Schools 2014*. 300016302. NCDoE.

Nyathi, L. (2021). *Challenges facing SMEs in the Western Cape townships with a focus on gender issues*. Faculty of Commerce, Graduate School of Business (GSB), University of Cape Town.

Qobo, M., & Soko, M. (2015). The rise of development finance institutions: South Africa, BRICS and regional strategy. Development Southern Africa, 24(1), 335–344. 10.1080/03768350701327269%5Cnhttp://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=25728115&site=ehost-live

Qutoshi, S. B. (2018). Phenomenology: A Philosophy and Method of Inquiry. Journal of Education and Educational Development, 5(1), 215. https://doi.org/10.22555/joeed.v5i1.2154

Rozenberg, J., & Fay, M. (Eds.). (2019). Beyond the gap: How countries can afford the infrastructure they need while protecting the planet (Sustainable Infrastructure series). World Bank.

Saunders, M., Lewis, P. and Thornhill, A. (2016). Research methods for business students. *Journal of Applied Accounting Research, 17*(2), 118-135

Salawu, R., Shamsuddin, A.O., Bolatitio, S., Masibo, S. (2023). Theoretical and conceptual frameworks in research: conceptual clarification. *European Chemical Bulletin, 12*, 2103-2117. 10.48047/ecb/2023.12.12.139.

Salazar, N. (2020). *Sustainable finance, DFIs and developing countries*. OPEC Fund Quarterly. OPEC Fund for International Development. https://opecfund.org. https://opecfund.org/news/sustainable-finance-dfis-and-developing-countries

Seobi, B. A., & Wood, L. (2016). Improving the instructional leadership of heads of department in under-resourced schools: A collaborative action-learning approach. *South African Journal of Education, 36*(4), 1–14. https://doi.org/10.15700/saje.v36n4a1326

Singh, P. (2008). Financing resources in historically disadvantaged schools in the Eastern Cape. *Journal of Business and Management Dynamics, 2*(1), 54–67.

Spillane, J. P., Harris, A., Jones, M., & Mertz, K. (2015). Opportunities and challenges for taking a distributed perspective: Novice school principals' emerging sense of their new position. *British Educational Research Journal, 41*(6), 1068–1085. https://doi.org/10.1002/berj.3166

Stahl, N. A., & King, J. R. (2020). Understanding and Using Trustworthiness in Qualitative Research. *Journal of Developmental Education, 44*(1), 26–26. https://doi.org/10.4135/9781483329574

Taherdoost H. (2018). Determining Sample Size; How to Calculate Survey Sample Size by Hamed Taherdoost: SSRN. *International Journal of Economics and Management Systems, 2*(February 2017), 237–239.

Tiara Octavia, E., . I., & Sholikah, M. (2020). *How Do School Facilities Affect School Quality? Case Study in Vocational High School at Pati, Indonesia*. KnE Social Sciences. https://doi.org/10.18502/kss.v4i6.6648

The Banking Association South Africa. (2023). *Integrated Report 2023*. https://www.banking.org.za/wp-content/uploads/2024/09/BASA_IAR-2023.pdf

UNESCO. (2019). *Girls' education and gender equality: Education transforms lives*. United Nations Educational, Scientific and Cultural Organization. https://unesdoc.unesco.org

UNICEF. (2021). *Reimagining education infrastructure in Eastern and Southern Africa: Key lessons and innovations*. https://www.unicef.org

van Dyk, H., & White, C. J. (2019). Theory and practice of the quintile ranking of schools in South Africa: A financial management perspective. *South African Journal of Education, 39*(September), 1–9. https://doi.org/10.15700/saje.v39ns1a1820

Sharma, H.L. & Sarkar, C. (2019). Ethnography research: an overview. *International Journal of Advance and Innovative Research, 6*(2).

World Bank. (2019). Project appraisal document: Ethiopia GEQIP-E (P163050). https://documents.worldbank.org

World Bank. (2021). *Strengthening Teaching-Learning and Results for States (STARS) Project: Implementation status and results report* (India). https://documents.worldbank.org

World Bank. (2022). *Financing education in South Africa: Addressing equity and quality*. Washington, DC: World Bank.

World Bank. (2023). *Equitable growth, finance & institutions insight: Institutional investors and sustainable infrastructure: A global review of case studies to finance the infrastructure gap*. World Bank.

Yangambi, M. (2023). Impact of School Infrastructures on Students Learning and Performance: Case of Three Public Schools in a Developing Country. *Creative Education, 14*(04), 788–809. https://doi.org/10.4236/ce.2023.144052

Zikhali, C. N. (2021). *The Impact of Development Finance Institutions on Economic Growth: A case of South Africa*. Faculty of Commerce, Graduate School of Business (GSB), University of Cape Town.

APPENDIX A: INTERVIEW SURVEY/CONSENT FORM

Master of Commerce in Development Finance
INTERVIEW/SURVEY CONSENT FORM

Participant name:_____

I volunteer to participate in a research project conducted by **(Jonita Phatheka Jack)** as partial fulfilment of the requirements for the **MCom Development Degree** at the Graduate School of Business. I understand that the research is designed to gather information about *DFI funding and infrastructure development in South Africa: A case of under-resourced schools in Northern Cape* and that I will be one of approximately five people being interviewed for this research.

BACKGROUND AND PURPOSE OF THE RESEARCH

The purpose of the research is to assess whether the Department of Education utilises funding from the different Development Finance Institutions to close the gap between government allocations for infrastructure development in the Northern Cape's under-resourced schools.

ETHICS APPROVAL

The ethical clearance for this study was approved by the UCT GSB Research and Ethics Committee on 30/04/2024.

PARTICIPATION AND CONFIDENTIALITY

I understand that my participation in this research is voluntary, that I will not be compensated, and that I may withdraw at any time. The interview will take approximately 30 - 45 minutes to complete and will be audio recorded.

I understand that I will not be identified by name in any reports using information obtained from this interview and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.

Should you have any questions or concerns, please contact me (jckjon005@myuct.ac.za) or my supervisor (latif.alhassan@uct.ac.za).

CONSENT

I consent to participate in this interview, based on the terms outlined above and subject to the following additional condition of my own (if any).

Signed by Interviewee	**Date**
Signed by Student	**Date**

APPENDIX B: INTERVIEW QUESTIONS

Part A: interview with subject area experts for research question (how does DFI-funded infrastructure development improve under-resourced schools?)

SECTION 1: DEMOGRAPHIC INFORMATION

1. Interview Date:
2. Start time of interview:
3. Gender of respondent:
4. Age of respondent:
5. Nature of institution:
6. Years of experience:
7. Current role in the institution:

SECTION 2: INTERVIEW/SURVEY QUESTIONS

8. Perceived Impact of Infrastructure Development: In what ways has your school's physical learning environment been enhanced by the infrastructure development sponsored by DFIs?
9. Quality of Educational Materials: Have students and teachers had better access to educational materials (such as computers and textbooks) as a result of the DFI-funded infrastructure development?
10. Learning Environment: How has the school's general learning environment been impacted by the upgraded infrastructure?
11. Student Engagement: Since the infrastructure was developed, have you noticed any changes in the way students participate in class activities and engage with the material?
12. Community Impact: What good effects has the infrastructure development had on the neighbourhood?
13. Issues and worries: Despite the advancements in infrastructure, what are the primary issues or worries that remain?
14. Future Requirements: What more upgrades or financial commitments, in your opinion, are required to raise the standard of instruction at these schools?
15. What other benefits have the recent DFI-funded infrastructure improvements brought to your school's instruction and student body?
16. What effects have better infrastructure had on student involvement and attendance?
17. What extra funding or support could your school provide to improve the quality of instruction even more?
18. End time of interview