

# Towards Efficient School Textbook Procurement and Distribution in the Khomas Region, Namibia

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**How to cite this paper:** Aloovi, O. A., & Sisinyize, N. (2026). Towards Efficient School Textbook Procurement and Distribution in the Khomas Region, Namibia. *Creative Education*, 17, 1984-2007. <https://doi.org/10.4236/ce.2026.1710112>

**Received:** September 10, 2026

**Accepted:** October 20, 2026

**Published:** October 23, 2026

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## Abstract

Efficient school textbook procurement and distribution are essential for effective curriculum implementation, quality teaching and equitable access to learning resources. Despite Namibia's National Textbook Policy and established public procurement framework, participants in the Khomas Region reported challenges relating to procurement delays, inventory management, logistics, stakeholder coordination and textbook availability. The study examined strategies for improving the efficiency of school textbook procurement and distribution in the Khomas Region of Namibia. The study was underpinned by Supply Chain Management Theory, which emphasises the integration of demand forecasting, procurement, inventory management, logistics and distribution to ensure that resources reach end-users at the right time, in appropriate quantities and at acceptable cost. An interpretivist paradigm and qualitative exploratory research design were adopted. Seventeen purposively selected participants were drawn from the Ministry of Education, the Khomas regional education office, schools and private textbook suppliers. Data were generated through semi-structured interviews and analysis of the National Textbook Policy, the Public Procurement Act, 2015, and the National Institute for Educational Development's 2024 impact study on the implementation of the National Textbook Policy. The data were analysed using a combined deductive-inductive thematic approach. The findings indicate that, although the centralised procurement system promotes standardisation, accountability and compliance, participants reported lengthy approval procedures, fragmented communication, delayed budget disbursements, inadequate transport capacity, weak inventory management and inaccurate demand information. Participants also reported instances of textbook shortages and the use of coping measures such as textbook sharing and photocopying. Integrated digital procurement plat-

forms, electronic inventory management, barcode-based tracking, improved stakeholder collaboration and selective decentralisation were identified as potential strategies for strengthening supply-chain responsiveness and accountability. The findings indicate that technology alone is insufficient and must be accompanied by institutional capacity development, reliable financing and governance improvements. The study concludes that improving textbook provision requires an integrated, responsive and data-informed education supply chain that balances national oversight with operational flexibility while recognising that the empirical evidence reflects the experiences of the study participants and the documents reviewed.

## Keywords

School Textbooks, Procurement, Distribution, Supply Chain Management, Digital Technologies

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## 1. Introduction

Adequate and timely access to textbook remains fundamental to effective curriculum implementation, teaching quality and equitable learning opportunities (UNESCO, 2024; NIED, 2024). Textbooks provide structured curriculum content, support classroom instruction and enable learners to engage in independent learning, particularly in education systems where other instructional resources remain limited (UNESCO, 2024; World Bank, 2024). However, ensuring textbook availability requires more than adequate financial allocation; it depends on effective forecasting, procurement, supplier management, inventory control, transportation and distribution (World Bank, 2024; NIED, 2024). Weaknesses at any stage of the book supply chain can result in delays, shortages, inefficient resource utilisation and unequal access to learning materials (World Bank, 2024). Recent evidence from Africa further emphasises the importance of ensuring that learners have access to curriculum-aligned textbooks and teachers have appropriate instructional materials to support effective teaching (UNESCO, 2024). Thus, efficient textbook procurement and distribution should be understood as an integral component of education-system management, quality assurance and equitable access to education (UNESCO, 2024; World Bank, 2024).

In Namibia, equitable access to school textbook has been an established education-policy priority, yet evidence continues to indicate challenges in the procurement, distribution and use of textbooks in schools (NIED, 2024). The national impact study on the implementation of the National Textbook Policy identified operational concerns across the textbook supply chain, reinforcing the need for improved planning, coordination, accountability and distribution mechanisms (NIED, 2024). International evidence similarly demonstrates that efficient procurement and distribution require reliable demand information, transparent procurement processes, effective supply-chain coordination and appropriate moni-

toring systems (World Bank, 2024). The Khomas Region provides an important context for examining these issues because differences in school enrolment, resource requirements and institutional capacity can influence the efficiency and equity of textbook provision (NIED, 2024). Despite the policy importance of textbook availability, limited empirical attention has been given to the operational factors affecting textbook procurement and distribution at regional level in Namibia. This study therefore examines textbook procurement and distribution in the Khomas Region, focusing on the challenges affecting efficiency and identifying strategies for strengthening coordination, accountability, supply-chain management and timely access to textbooks (NIED, 2024; World Bank, 2024).

## 2. Background of the Study

The provision of quality education depends not only on effective teaching practices and qualified educators but also on the availability of adequate learning resources that support curriculum implementation (UNESCO, 2024). Among these resources, textbooks remain one of the most influential inputs in enhancing teaching and learning, particularly in education systems where access to supplementary digital and instructional materials remains limited. Textbooks provide structured content, reinforce curriculum objectives, support lesson preparation, and enable learners to engage in independent learning activities (UNESCO, 2024). Consequently, efficient textbook procurement and distribution systems are essential components of education quality assurance, as delays or shortages in textbook availability can directly affect curriculum delivery and learner achievement (UNESCO, 2024).

Globally, education systems continue to experience challenges in ensuring equitable access to learning materials despite increased investments in education. According to the World Bank (2023), the effectiveness of textbook provision is influenced not only by financial allocation but also by the efficiency of procurement processes, supply chain coordination, demand forecasting, inventory management, and distribution mechanisms. In many developing countries, weaknesses in education supply chains have resulted in delayed textbook deliveries, shortages in schools, and unequal access to learning resources, particularly among learners in disadvantaged communities (UNESCO, 2024). These challenges highlight the need for education systems to adopt innovative and sustainable approaches that improve transparency, accountability, and responsiveness in textbook management.

In sub-Saharan Africa, textbook availability remains a persistent challenge due to complex procurement procedures, limited institutional capacity, inadequate data management systems, and logistical constraints associated with reaching schools across diverse geographical contexts (Read & Atinc, 2017). Although many countries have developed textbook policies aimed at improving access to learning materials, implementation challenges often limit the achievement of policy objectives (Read & Atinc, 2017). Effective textbook supply systems therefore

require integrated approaches that combine appropriate policy frameworks, efficient public procurement practices, reliable information systems, and coordinated stakeholder engagement.

Namibia has placed significant emphasis on improving access to quality education since independence, with educational equity and improved learning outcomes forming key priorities within national education policies. The National Textbook Policy was developed to guide the procurement, management, and distribution of textbooks to ensure that learners have equitable access to essential learning materials (Ministry of Education, 2008). The policy recognises textbooks as critical educational resources and aims to strengthen systems that support timely and adequate textbook provision across schools. However, despite these policy commitments and substantial government investment in educational resources, challenges associated with textbook procurement and distribution continue to affect schools. The recent Impact Study on the Implementation of the National Textbook Policy in Namibian Schools revealed ongoing concerns related to textbook availability, procurement delays, supply chain coordination, and monitoring mechanisms, indicating that improvements are required to strengthen the effectiveness of textbook delivery systems (NIED, 2024).

The challenges associated with textbook procurement and distribution are particularly relevant within the Khomas Region, which represents one of Namibia's most populated and educationally diverse regions. As the administrative and economic centre of the country, Khomas consists of schools serving learners from varied socio-economic backgrounds and operating under different resource conditions (NIED, 2024). Although the region benefits from relatively better access to infrastructure and administrative support compared with some remote regions, schools continue to experience challenges related to delayed textbook deliveries, shortages, and inconsistencies in textbook allocation (NIED, 2024). Such challenges create disruptions in teaching and learning processes, as teachers may be required to implement curricula without adequate learning materials while learners experience reduced opportunities for effective engagement with subject content.

Inefficiencies within textbook procurement and distribution systems have implications beyond logistical concerns. When textbooks do not reach schools on time or in sufficient quantities, the consequences may include reduced curriculum coverage, increased workload for teachers, limited learner participation, and widening inequalities between schools (UNESCO, 2024). Educational equity requires that learners, regardless of their geographical location or socio-economic circumstances, have access to the resources necessary to participate meaningfully in the learning process (UNESCO, 2024). Therefore, strengthening textbook supply systems is an important strategy for improving educational fairness and supporting Namibia's commitment to inclusive quality education.

Recent developments in public sector supply chain management demonstrate the potential of innovative approaches to address inefficiencies in resource distri-

bution. Digital procurement platforms, electronic inventory management systems, data-driven forecasting, and real-time tracking mechanisms have increasingly been adopted to improve transparency and operational efficiency in resource management (World Bank, 2023). In the education sector, these approaches can support more accurate textbook demand planning, reduce procurement delays, strengthen accountability among stakeholders, and enable education authorities to monitor textbook availability more effectively (World Bank, 2023). However, successful implementation requires not only technological solutions but also improved coordination among national education authorities, regional offices, schools, suppliers, and communities.

Despite the importance of textbook availability in improving educational outcomes, limited empirical research has examined the specific processes influencing textbook procurement and distribution efficiency within the Namibian regional education context. Existing studies and policy documents have largely focused on general challenges related to education resource provision, with limited attention given to operational bottlenecks, stakeholder coordination, and innovative strategies that can strengthen textbook supply chains at regional level. This knowledge gap is particularly evident in the Khomas Region, where a deeper understanding of current practices and challenges is required to inform evidence-based improvements.

It is against this background; this study investigates strategies towards improving school textbook procurement and distribution efficiency in the Khomas Region of Namibia. The study seeks to examine existing challenges within textbook supply processes, explore innovative approaches for enhancing efficiency and accountability, and propose context-specific strategies that can support timely and equitable access to textbooks. By contributing empirical insights into education resource management, the study aims to support policymakers, education managers, and practitioners in strengthening textbook supply systems and advancing Namibia's broader goal of improving the quality and equity of education.

### 3. Statement of the Problem

Despite Namibia's commitment to improving equitable access to quality education, inefficiencies in school textbook procurement and distribution continue to affect effective curriculum implementation and learner outcomes (UNESCO, 2024). Although the National Textbook Policy aims to ensure timely and adequate provision of learning materials, recent evidence indicates persistent challenges related to procurement delays, textbook shortages, weak monitoring systems, and ineffective coordination among stakeholders (NIED, 2024). In the Khomas Region, these challenges are reflected in situations where some schools begin the academic year without sufficient textbooks, forcing teachers to share limited copies, photocopy materials, or adjust teaching activities due to resource shortages. Such practices reduce instructional effectiveness and create unequal learning opportunities among learners.

While global evidence highlights the potential of digital supply chain systems, improved data management, and innovative procurement approaches in strengthening educational resource delivery (UNESCO, 2024; World Bank, 2023), limited research has examined how these strategies can be adapted to improve textbook procurement and distribution within the Namibian regional context. The absence of context-specific evidence limits the ability of education managers and policy-makers to address existing supply chain inefficiencies. Therefore, this study seeks to explore strategies towards improving the efficiency, transparency, and equity of school textbook procurement and distribution in the Khomas Region of Namibia.

#### 4. Research Objectives

The study, which explored strategies for improving the efficiency of school textbook procurement and distribution in the Khomas Region of Namibia, was guided by the following objectives.

- 1) Examine the existing textbook procurement and distribution processes and systems within schools in the Khomas Region.
- 2) Determine the factors affecting the efficiency, timeliness, and equity of textbook distribution in the Khomas Region.
- 3) Propose strategies for enhancing the efficiency, transparency, and accountability of school textbook procurement and distribution systems in the Khomas Region.

#### 5. Significance of the Study

This study is significant as it addresses persistent inefficiencies in school textbook procurement and distribution that affect timely access to learning materials in the Khomas Region of Namibia. The findings will support the Ministry of Education, Innovation, Youth, Sports, Arts and Culture and regional education authorities in strengthening textbook management systems. For example, the study may inform the adoption of digital tracking systems to monitor textbook orders, deliveries, and school-level stock availability. Such innovations can improve transparency, reduce procurement delays, and ensure that learners receive textbooks at the beginning of the academic year (NIED, 2024; UNESCO, 2024).

The study will benefit education managers, school administrators, and teachers by providing strategies for improving textbook planning, ordering, and inventory management. For instance, accurate enrolment-based forecasting can reduce shortages and prevent excessive or duplicated orders among schools. Improved textbook distribution systems will enhance teacher preparedness, promote equitable access to learning resources, and support better learner engagement and outcomes. Therefore, the study contributes to strengthening efficiency, accountability, and sustainability in textbook supply management within the Khomas Region and Namibia's education system (World Bank, 2023).

## 6. Literature Review and Theoretical Framework

### 6.1. School Textbook Procurement Governance and Institutional Capacity

Efficient school textbook procurement depends largely on effective procurement governance, institutional capacity, and robust accountability mechanisms. Procurement governance encompasses the legal frameworks, organisational structures, decision-making processes, and monitoring systems that regulate the acquisition of educational resources (UNESCO, 2022). According to the OECD (2023), effective public procurement systems require transparency, competition, strategic planning, professional procurement capacity, and performance monitoring to ensure value for money and equitable service delivery. In the education sector, strong procurement governance is particularly important because textbooks represent a major public investment and directly influence teaching and learning outcomes (UNESCO, 2022).

Centralised procurement systems are commonly adopted by education authorities to achieve economies of scale, improve quality control, standardise learning materials, and reduce administrative costs (World Bank, 2021). The World Bank (2021) highlights that well-designed central procurement mechanisms can improve efficiency by consolidating demand, strengthening supplier negotiations, and ensuring alignment between curriculum requirements and educational resources. However, centralised systems may also experience challenges when institutional capacity is insufficient, particularly in procurement planning, supplier management, contract monitoring, and coordination between national, regional, and school-level structures (World Bank, 2021).

Recent studies emphasise that procurement inefficiencies in education are often not caused by weaknesses in procurement legislation but by implementation gaps, including limited technical expertise, inadequate procurement planning, weak contract management, and insufficient monitoring of supplier performance (OECD, 2023; World Bank, 2021). In developing education systems, these challenges may result in delayed textbook deliveries, inaccurate allocation of resources, and disparities in textbook availability between schools. UNESCO (2022) further notes that strengthening institutional capacity, professionalising procurement functions, and improving coordination among education stakeholders are essential strategies for ensuring reliable learning resource supply chains.

Within Namibia, textbook procurement operates within a public procurement framework governed by national procurement legislation and institutional arrangements involving education authorities and procurement agencies (UNESCO, 2022). However, improving efficiency requires continuous strengthening of procurement planning, contract administration, monitoring systems, and coordination mechanisms (UNESCO, 2022). Therefore, enhancing procurement governance and institutional capacity remains a critical foundation for ensuring that textbooks are procured efficiently, delivered on time, and distributed equitably across schools.

## 6.2. School Textbook Inventory Management and Distribution Logistics

According to [UNICEF \(2021\)](#), inventory management and distribution logistics represent essential components of an effective textbook supply chain. Unlike conventional procurement processes that focus mainly on purchasing, textbook availability depends on the ability of education systems to forecast demand accurately, manage inventories effectively, store materials appropriately, and coordinate transportation from central warehouses to schools ([UNICEF, 2021](#)). Education supply chains require integrated planning and information systems that connect procurement decisions with actual consumption patterns at school level ([UNICEF, 2021](#)).

Effective inventory management enables education authorities to maintain accurate records of available textbooks, monitor stock movements, identify shortages, and minimise wastage caused by overstocking or poor storage conditions. The [World Bank \(2020\)](#) argues that weak supply chain management remains a significant constraint in education systems, particularly in low- and middle-income countries where inadequate forecasting, fragmented distribution networks, and limited logistics capacity contribute to delayed access to learning materials.

Research on educational supply chains indicates that inaccurate enrolment projections, weak data management systems, and poor communication between administrative levels frequently result in unequal textbook distribution, where some schools experience shortages while others hold excess stock ([UNESCO, 2022](#)). Similarly, inefficient warehousing and transportation arrangements can increase operational costs and delay textbook availability, particularly during peak periods before the beginning of academic years.

For Namibia, improving textbook distribution efficiency requires strengthening inventory management practices across all levels of the education system. Although centralised procurement may provide purchasing advantages, efficiency depends on effective downstream logistics, including accurate school-level stock records, reliable redistribution mechanisms, and timely reporting of shortages. Consequently, investment in integrated inventory management systems and supply chain coordination is necessary to ensure that textbooks reach schools according to actual demand.

## 6.3. Digital Technologies for Procurement and Distribution of School Textbooks

The integration of digital technologies into procurement and supply chain management has transformed the way educational resources are planned, monitored, and distributed ([OECD, 2021](#)). Digital procurement systems, enterprise resource planning (ERP) platforms, electronic inventory management systems, and data-driven monitoring tools provide opportunities to improve transparency, efficiency, and accountability throughout the textbook supply chain. The [OECD \(2021\)](#) identifies digital transformation as a key strategy for improving public pro-

curement by increasing access to information, reducing administrative delays, and strengthening oversight mechanisms.

In education systems, digital inventory platforms enable real-time monitoring of textbook stocks, automated reporting of shortages, improved demand forecasting, and more accurate allocation decisions. [UNESCO \(2023\)](#) emphasises that data-driven education management systems allow policymakers to make evidence-based decisions by linking resource planning with reliable information on school needs and learner populations. Similarly, [UNICEF \(2021\)](#) highlights that digital supply chain tools can improve visibility across procurement and distribution networks, reducing inefficiencies caused by limited information sharing.

Digital textbook platforms and open educational resource (OER) repositories have also expanded opportunities for improving access to learning materials. According to [UNESCO \(2021\)](#), digital learning resources can complement printed textbooks by providing flexible and scalable access to educational content. However, digital solutions should be implemented cautiously because unequal access to internet connectivity, electricity, digital devices, and digital skills may reinforce existing educational inequalities.

In Namibia and other developing contexts, the successful adoption of digital textbook management systems requires investment in ICT infrastructure, staff capacity development, cybersecurity measures, and institutional readiness ([UNESCO, 2021](#)). Digital technologies should therefore be viewed as complementary tools that strengthen rather than replace existing textbook procurement and distribution systems. When appropriately implemented, digital solutions can improve planning accuracy, reduce supply chain inefficiencies, and enhance accountability in textbook management.

#### **6.4. Sustainable and Circular Approaches to Educational Resource Management**

Sustainable management of educational resources has gained increasing attention as governments seek to maximise public investment while reducing environmental impacts ([UNESCO, 2021](#)). Circular approaches to school textbook management focus on extending the useful life of learning materials through reuse, repair, redistribution, recycling, and integration of digital alternatives. The concept aligns with broader sustainability principles that emphasise resource efficiency, waste reduction, and long-term value creation ([UNESCO, 2021](#)).

School textbook reuse and redistribution programmes have been identified as effective strategies for improving resource efficiency, particularly in contexts where education systems face financial constraints. The [World Bank \(2022\)](#) notes that systematic textbooks recovery, maintenance, and redistribution mechanisms can significantly reduce procurement costs while improving access to learning materials. Similarly, [UNESCO \(2021\)](#) highlights that circular approaches contribute to sustainable education systems by reducing dependency on repeated production and disposal of printed resources.

Digital repositories and open educational resources provide additional opportunities for sustainability by expanding access to learning materials without the recurring costs associated with printing and physical distribution (UNESCO, 2023). However, evidence suggests that digital alternatives cannot completely replace printed textbooks, particularly in contexts where infrastructure challenges and digital inequalities remain significant (UNESCO, 2023). Printed materials continue to play an essential role in ensuring equitable access to learning resources.

Therefore, sustainable textbook management requires a balanced approach that combines efficient procurement systems, textbook reuse initiatives, improved maintenance practices, and selective integration of digital resources. In Namibia, where disparities in connectivity and access to digital technologies persist, sustainability strategies should prioritise strengthening existing textbook systems while gradually incorporating innovative approaches that enhance resource efficiency and long-term educational resilience.

### **6.5. Current Practices in School Textbook Procurement and Distribution in Namibia**

School textbook procurement and distribution in Namibia are governed by a public procurement framework aimed at promoting transparency, accountability, and value for money (UNESCO, 2024). However, evidence from education supply chain research indicates that textbook availability depends not only on procurement regulations but also on effective planning, inventory management, logistics, and coordination across administrative levels (UNESCO, 2022; UNICEF, 2021).

#### **6.5.1. National Procurement System**

Namibia's textbook procurement operates within the Public Procurement Act, 2015, which established the Central Procurement Board of Namibia (CPBN) and Procurement Management Units (PMUs) to strengthen procurement governance and compliance (Republic of Namibia, 2015). The centralised procurement approach supports efficiency through bulk purchasing, standardised procedures, and improved accountability. According to the OECD (2023), central procurement systems can achieve greater value for money when supported by strong institutional capacity, accurate planning, and effective contract management.

However, centralisation may also create delays when procurement processes are lengthy, coordination between institutions is weak, or demand information from schools is inaccurate. Effective textbook procurement therefore requires stronger integration between the Ministry of Education, procurement structures, regional offices, and schools to ensure that purchasing decisions reflect actual textbook requirements (UNESCO, 2022). Thus, while Namibia has established appropriate governance structures, their contribution to efficiency depends on improved planning, monitoring, and supply chain coordination.

### 6.5.2. Textbook Distribution in the Khomas Region

The Khomas Region provides an important setting for examining textbook distribution efficiency due to its urban location, proximity to national institutions, and relatively developed transport infrastructure. These factors provide logistical advantages that can support timely textbook delivery and redistribution. However, supply chain literature shows that infrastructure alone does not guarantee effective distribution; efficiency also depends on accurate inventory systems, reliable data, and effective school-level management (UNICEF, 2021).

Despite its logistical advantages, textbook distribution efficiency may be constrained by challenges such as inaccurate stock records, weak inventory monitoring, and inconsistent reporting of textbook needs. Such operational weaknesses can affect textbook availability and learner-book ratios, resulting in unequal access among schools. Therefore, improving textbook distribution in Khomas requires strengthening inventory management, school-level record keeping, and coordination between regional authorities and schools.

### 6.5.3. International Best Practices for Efficient School Textbook Procurement

International experiences demonstrate that efficient textbook procurement increasingly depends on the integration of technology, reliable data systems, and supply chain management approaches (OECD, 2023). Rather than replacing conventional procurement systems, digital innovations strengthen planning, transparency, inventory control, and decision-making. For Namibia, these practices provide lessons on how technology can improve textbook procurement and distribution efficiency, particularly within the Khomas Region.

### 6.5.4. Technology-Driven Procurement Systems

A major lesson from international best practices is the adoption of technology-driven procurement and supply chain systems that connect procurement planning, inventory management, and distribution processes. Enterprise Resource Planning (ERP) systems integrate procurement, finance, inventory, and logistics information into a single platform, enabling education authorities to monitor textbook requirements, track orders, and improve accountability (OECD, 2023). According to the OECD (2023), digital procurement systems enhance efficiency by reducing administrative delays, improving transparency, and supporting evidence-based procurement decisions.

Digital textbook management systems also provide opportunities to improve access and reduce pressure on traditional supply chains. UNESCO (2023) highlights that digital platforms, electronic repositories, and open educational resources can expand access to learning materials while supporting more flexible resource management. However, UNESCO (2023) cautions that digital solutions must be implemented alongside investments in infrastructure, connectivity, and digital capacity to avoid increasing existing inequalities.

Another important international practice is the use of forecasting software and data analytics to improve demand estimation. Data-driven forecasting allows ed-

education authorities to use enrolment trends, textbook utilisation records, and historical consumption patterns to determine procurement quantities more accurately. Such systems reduce risks of over-procurement, shortages, and inefficient allocation of learning resources (UNICEF, 2021).

For Namibia, these practices provide important lessons for improving textbook procurement efficiency in the Khomas Region. An integrated digital textbook management system linking the Ministry of Education, regional offices, and schools could improve visibility of textbook stocks, strengthen redistribution mechanisms, and support timely procurement decisions. Given Khomas Region's relatively developed infrastructure and proximity to national institutions, it provides a suitable environment for piloting digital inventory monitoring and demand forecasting systems before possible expansion to other regions.

However, technology adoption should be accompanied by investment in ICT infrastructure, user training, data governance, and system sustainability. As UNESCO (2023) notes, technology improves education management only when it is aligned with institutional capacity and contextual realities. Therefore, the Namibian approach should focus on using technology as an enabler of stronger procurement and distribution processes rather than as a standalone solution.

#### 6.5.5. Theoretical Framework

This study adopted Supply Chain Management (SCM) Theory (push, pull and hybrid models) as the primary theoretical lens for examining the efficiency of school textbook procurement and distribution in the Khomas Region, Namibia. SCM Theory posits that organisational performance depends on the effective integration and coordination of demand forecasting, procurement, inventory management, warehousing, transportation, and last-mile distribution to ensure that the right resources reach end-users at the right time, in the right quantities, and at the lowest possible cost (Christopher, 2022; Chopra & Meindl, 2023). Within the education sector, textbook procurement functions as a public-sector supply chain involving multiple stakeholders, including the Ministry of Education, Innovation, Youth, Sport, Art and Culture procurement authorities, publishers, logistics providers, regional education offices, and schools. Consequently, inefficiencies at any stage of the supply chain can lead to procurement delays, stock shortages, excess inventory, and inequitable access to textbooks.

SCM Theory identifies three principal supply models: push, pull, and hybrid systems. In a push system, textbooks are procured centrally and distributed to schools based on projected enrolment and anticipated demand, enabling economies of scale but increasing the risk of overstocking or shortages when forecasts are inaccurate (Christopher, 2022). By contrast, a pull system is demand-driven, where procurement and replenishment are triggered by actual textbook requirements reported by schools, thereby improving responsiveness and reducing inventory waste. However, its effectiveness depends on reliable information systems and strong institutional capacity (Chopra & Meindl, 2023). More recently, supply chain scholars have advocated hybrid systems, which combine centralised pro-

curement of baseline textbook requirements with demand-responsive replenishment based on actual school needs. Hybrid models are considered more efficient because they balance cost-effectiveness, flexibility, and equitable distribution while responding to variations in local demand (Fredriksen et al., 2015).

The adoption of SCM Theory provides a comprehensive framework for analysing how integrated supply chain practices can improve the efficiency, equity, and sustainability of school textbook procurement and distribution in the Khomas Region. The theory is particularly relevant to this study because it facilitates an assessment of how demand forecasting, procurement planning, inventory management, logistics coordination, and last-mile delivery collectively influence the timely availability of textbooks in schools.

## 7. Methodology

This study adopted an interpretivist research paradigm to explore stakeholders' experiences and perceptions regarding the efficiency of school textbook procurement and distribution in the Khomas Region of Namibia. The interpretivist paradigm is appropriate for examining context-specific institutional processes and understanding how stakeholders interpret procurement and distribution practices within their operational environments (Creswell & Creswell, 2023).

A qualitative exploratory research design was employed to investigate factors influencing textbook procurement and distribution efficiency and to identify strategies for improvement. Exploratory qualitative research is suitable for examining complex organisational processes where limited empirical evidence exists and where the objective is to generate contextually relevant insights rather than statistical generalisations (Patton, 2020).

The study was conducted in the Khomas Region and involved 17 participants selected purposively because of their direct roles in the textbook supply chain. The final participant distribution was: two senior procurement officers from the Ministry of Education, Innovation, Youth, Sport, Arts and Culture; one procurement/logistics officer from the Khomas regional education office; four school principals; eight teachers responsible for or involved in textbook management; and two representatives of private textbook suppliers. Thus, the evidence represented national policy and procurement, regional logistics, school leadership and classroom-level implementation, and supplier perspectives. The specific schools and supplier organisations are not named to protect institutional and participant confidentiality. Inclusion criteria required participants to have direct knowledge or practical responsibility for textbook procurement, requisitioning, inventory management, distribution, classroom use, supplier fulfilment, or related oversight. Within each stakeholder group, participants were selected to provide information-rich accounts and variation in institutional responsibility and operational experience (Palinkas et al., 2015; Creswell & Creswell, 2023). The participant distribution and purposive selection criteria are presented in **Table 1**.

Data was collected through in-depth semi-structured interviews and document

analysis. The documentary component comprised the National Textbook Policy (Ministry of Education, 2008), the Public Procurement Act, 2015 (Republic of Namibia, 2015), and the National Institute for Educational Development's (NIED) 2024 Impact Study on the Implementation of the National Textbook Policy in Namibian Schools. These documents were selected because they directly addressed the policy, governance, procurement and implementation arrangements relevant to textbook provision in Namibia and provided documentary evidence against which participant accounts could be examined. During analysis, relevant documentary statements were coded alongside interview material rather than treated as a separate source of themes. Convergences, complementarities and discrepancies between documentary evidence and participant accounts were recorded during theme development. This approach enabled triangulation without treating participant reports as documentary proof of system-wide performance (Bowen, 2009). Data collection continued until the researchers judged that subsequent interviews were yielding no materially new categories relevant to the research objectives (Guest et al., 2020). The documentary sources, selection criteria and analytical uses are summarised in **Table 2**.

The collected data were analysed using thematic analysis following Braun and Clarke's (2021) six-phase approach. Coding was combined deductive-inductive: deductive codes were derived from the study objectives and the SCM concepts of demand forecasting, procurement, inventory management, logistics/distribution, and push, pull and hybrid supply models; inductive coding allowed issues that were not predetermined by the framework to emerge from participants' accounts and the documents. Initial codes included approval delays, budget release, communication, supplier payment, transport, stock records, demand information, digital tracking, decentralisation and stakeholder collaboration. Codes were compared within and across participant groups and documentary sources, then clustered into candidate themes. The SCM concepts were used as sensitising concepts to interpret how the emerging issues related to different stages and configurations of the textbook supply chain; they did not predetermine the final themes. NVivo was used to organise transcripts and documentary material, apply codes, compare coded evidence across stakeholder groups, and maintain an auditable record of the analysis. The combined deductive-inductive coding framework linking SCM concepts and emergent codes to the final themes is presented in **Table 3**.

To ensure trustworthiness, the study adopted the criteria of credibility, dependability, confirmability and transferability. Credibility was strengthened through triangulation of interview and documentary evidence and comparison of accounts across the five stakeholder categories. An audit trail, systematic coding framework and explicit attribution of evidence to stakeholder groups supported dependability and confirmability. Rich contextual descriptions were provided to support assessment of transferability to similar educational settings (Lincoln & Guba, 1985; Braun & Clarke, 2021). The attribution of themes and supporting evidence across participant groups is summarised in **Table 4**.

Ethical approval was obtained from the relevant institutional authorities before data collection commenced. Participation was voluntary, informed consent was obtained from all participants, and confidentiality and anonymity were maintained throughout the study. Ethical principles of voluntary participation, privacy, and responsible data management were observed in accordance with accepted qualitative research standards (Creswell & Creswell, 2023).

The participant groups, their roles and the criteria used for purposive selection are summarised in **Table 1**.

**Table 1.** Participant distribution and selection criteria.

| Stakeholder group                | n  | Role/evidence perspective                                       | Selection criterion                                                                   |
|----------------------------------|----|-----------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Ministry procurement officials   | 2  | National procurement, policy and compliance                     | Direct responsibility or knowledge of textbook procurement and procurement procedures |
| Khomas regional education office | 1  | Regional procurement/logistics and distribution coordination    | Direct responsibility or knowledge of regional textbook logistics/distribution        |
| School principals                | 4  | School-level requisitioning, allocation and resource management | Direct responsibility for school management and textbook provision                    |
| Teachers                         | 8  | Classroom-level textbook management and use                     | Direct experience of textbook availability, use and coping practices                  |
| Private textbook suppliers       | 2  | Supplier fulfilment and contract delivery                       | Direct experience of supplying textbooks to government/schools                        |
| Total                            | 17 | National, regional, school and supplier perspectives            | Purposive selection across the textbook supply chain                                  |

The documentary sources and their respective selection criteria and analytical uses are presented in **Table 2**.

**Table 2.** Documentary sources and analytical use.

| Document                                                                                           | Selection criterion                                                                                          | Analytical use                                                                                                                |
|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| National Textbook Policy (2008)                                                                    | Directly establishes policy objectives and management arrangements for school textbooks.                     | Compared intended textbook procurement/allocation arrangements with participant accounts.                                     |
| Public Procurement Act, 2015                                                                       | Directly governs public procurement procedures and compliance requirements relevant to textbook acquisition. | Used to interpret procurement, approval, tendering, compliance and accountability issues.                                     |
| NIED Impact Study on the Implementation of the National Textbook Policy in Namibian Schools (2024) | Directly examines implementation of the textbook policy and relevant operational concerns.                   | Used as contextual/corroborating evidence when interpreting participant accounts about coordination and inventory management. |

The combined deductive-inductive coding framework, showing how SCM concepts and inductively generated codes informed the final themes, is presented in **Table 3**.

**Table 3.** Combined coding framework linking SCM concepts to final themes.

| Analytical level       | SCM-informed/deductive codes                                      | Inductively generated codes                                                | Connection to final themes                |
|------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------|
| Demand forecasting     | Forecast accuracy; enrolment-based demand; demand information     | Inconsistent requests; outdated information; duplication of orders         | Current practices; challenges; strategies |
| Procurement            | Approval; tendering; compliance; supplier fulfilment              | Approval delays; budget release; supplier payment; procurement flexibility | Current practices; challenges             |
| Inventory management   | Stock records; stock visibility; allocation                       | Weak inventory records; shortages; redistribution needs                    | Challenges; strategies                    |
| Logistics/distribution | Warehousing; transport; last-mile delivery                        | Transport capacity; warehousing; delivery coordination                     | Challenges; strategies                    |
| Push model             | Centralised procurement; projected demand; bulk purchasing        | Central control; standardisation; limited local flexibility                | Current practices; challenges             |
| Pull model             | Actual school demand; responsive replenishment                    | Real-time reporting; local responsiveness                                  | Strategies                                |
| Hybrid model           | Central baseline procurement plus demand-responsive replenishment | Selective decentralisation; regional responsiveness                        | Strategies                                |

## 8. Findings

The attribution of themes across participant groups and the evidence recorded in the manuscript are summarised in **Table 4**.

**Table 4.** Theme attribution and participant evidence.

| Final theme                                  | Ministry                  | Regional                  | School                    | Supplier                  | Evidence recorded in manuscript                                                                                                                                                                     |
|----------------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Current procurement practices/centralisation | Yes                       | Not separately attributed | Yes                       | Not separately attributed | A ministry procurement officer described compliance requirements; a school principal reported prolonged approvals. The procurement process also involves regional consolidation.                    |
| Challenges affecting efficiency              | Not separately attributed | Not separately attributed | Yes                       | Yes                       | Teachers reported textbook sharing/photocopying; suppliers reported effects of delayed government payments. Other challenges are described as participant-reported but are not quantified by group. |
| Strategies for improved efficiency           | Not separately attributed | Yes                       | Not separately attributed | Not separately attributed | Regional officials emphasised real-time data sharing; participants generally proposed digital systems, tracking, decentralisation, capacity building and stronger government-supplier partnerships. |

Continued

|                                              |                                         |                                                      |                                               |                                        |                                                                                                                                                                                 |
|----------------------------------------------|-----------------------------------------|------------------------------------------------------|-----------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interpretive<br>SCM pattern<br>across themes | Referenced in<br>procurement<br>account | Referenced in<br>regional<br>coordination<br>account | Referenced in<br>requisition/<br>use accounts | Referenced in<br>fulfilment<br>account | The final interpretation integrates forecasting, procurement, inventory, logistics and push-pull-hybrid concepts; the manuscript does not provide theme-level frequency counts. |
|----------------------------------------------|-----------------------------------------|------------------------------------------------------|-----------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

8.1. Current School Textbook Procurement and Distribution Practices

The findings indicate that textbook procurement in the Khomas Region is characterised by a highly centralised system coordinated by the Ministry of Education, Innovation, Youth, Sports, Arts and Culture. Schools prepare annual textbook requisitions based on learner enrolment, which are consolidated at regional level before being submitted for ministerial approval and procurement through national tenders. Interview evidence from a school principal and a ministry procurement officer illustrates two dimensions of the process: the principal reported that “schools submit textbook requirements well before the academic year, yet approvals often take several months, affecting timely delivery”, while the ministry procurement officer observed that “strict procurement procedures ensure compliance but often reduce operational flexibility”. These accounts indicate that both school-level and ministry-level participants perceived a tension between procedural compliance and operational responsiveness. The evidence recorded in the interviews therefore supports the theme from these two stakeholder perspectives; it should not be read as a claim that every participant reported the same experience.

The documentary evidence provides context for these accounts. The National Textbook Policy (2008) establishes the policy basis for textbook provision, while the NIED (2024) impact study identifies coordination and inventory-management concerns in implementation. Taken together, the interview and documentary evidence suggest a gap between formal procurement arrangements and operational responsiveness. The evidence supports closer integration among schools, regional offices, suppliers and national procurement structures, but the qualitative data do not permit a system-wide estimate of the frequency or duration of procurement delays.

8.2. Challenges Affecting Efficient Textbook Procurement and Distribution

Participants described financial, institutional and logistical constraints affecting textbook distribution. The interview material specifically records delayed budget releases, prolonged procurement procedures, inadequate transport capacity, weak inventory management and ineffective communication as reported challenges. School-level participants reported that textbook shortages sometimes required teachers to share textbooks among learners or photocopy learning materials during the first weeks of the academic year. Supplier participants reported that delayed government payments affected their capacity to fulfil contracts within ex-

pected timelines. These are participant-reported experiences rather than independently verified measures of system-wide shortages, delivery performance or payment delays. The documentary sources were therefore used to provide policy and implementation context rather than to convert these accounts into population-level performance claims.

The pattern of reported challenges can be interpreted through the SCM framework. Budget and approval issues relate to procurement governance; weak stock records and inaccurate demand information relate to inventory and forecasting; transport constraints relate to logistics and distribution; and fragmented communication cuts across the information flows required to coordinate the supply chain. The findings therefore indicate that the reported difficulties extend beyond finance to interconnected governance, information and operational processes. This interpretation is consistent with the documentary and literature evidence discussed in the study, but the attribution of specific problems to participant groups is limited to the evidence explicitly recorded in the interview data.

### **8.3. Strategies towards Efficient School Textbook Procurement and Distribution**

Participants proposed several strategies for improving textbook procurement and distribution efficiency in the Khomas Region. The interview evidence identifies integrated digital procurement platforms, electronic inventory management systems, barcode-based textbook tracking, decentralisation of selected procurement functions, continuous capacity building for procurement personnel, stronger government-supplier partnerships, and real-time data sharing between schools and regional offices. Regional officials were specifically reported as emphasising real-time data sharing to improve forecasting accuracy and reduce duplication of textbook orders. The manuscript does not contain a coded frequency count for each proposed strategy; consequently, these interventions are presented as reported suggestions rather than ranked according to participant frequency.

The strategies can be linked directly to the SCM concepts used in the analysis. Digital procurement and inventory systems address information visibility and inventory control; improved data sharing strengthens demand forecasting; supplier partnerships address procurement and fulfilment coordination; and selective decentralisation introduces a pull or hybrid element into a predominantly centralised push arrangement. Participants also recognised that technological innovation alone cannot resolve procurement inefficiencies unless it is accompanied by adequate funding, institutional capacity development and transparent governance structures. The evidence therefore supports an integrated approach rather than a technology-only intervention.

## **9. Discussion**

The findings of this study demonstrate that the efficiency of school textbook procurement and distribution in the Khomas Region extends beyond the availability

of financial resources and is fundamentally influenced by the interaction between procurement governance, institutional capacity, supply chain management, technological innovation, and stakeholder coordination. Although Namibia has established a comprehensive policy framework through the National Textbook Policy to ensure equitable access to learning materials, the study reveals a persistent implementation gap between policy intentions and operational practice (UNESCO, 2024). The centralised procurement model, while designed to promote accountability, transparency, and value for money, has inadvertently created lengthy approval processes, fragmented communication, and delayed decision-making that compromise the timely delivery of textbooks to schools (NIED, 2024). These findings suggest that policy effectiveness depends not only on the quality of policy design but also on the capacity of institutions to implement procurement processes that are responsive, adaptive, and learner centred. Similar observations have been made by UNESCO (2024), which argues that improvements in educational resource provision require stronger implementation mechanisms rather than the development of additional policies.

A critical issue emerging from this study is the reported tension between centralised procurement decision-making and local responsiveness. While centralised procurement offers economies of scale and standardised quality assurance, participants indicated that regional offices and schools have limited influence once textbook requisitions are submitted. Some participating school stakeholders reported delays that affected curriculum implementation, while the ministry participant described the compliance requirements as reducing operational flexibility. These accounts are consistent with international evidence that highly centralised procurement can create responsiveness challenges, but the present study does not establish the prevalence of such delays across all schools in the region. The study therefore considers carefully designed decentralisation mechanisms as a potential way of balancing accountability with operational flexibility while maintaining national oversight.

The study further highlights logistical inefficiencies as an important issue in the participant accounts concerning textbook distribution. Participants reported inadequate transport arrangements, limited warehousing capacity, weak inventory management and poor coordination between procurement units and schools as factors associated with textbook availability problems. These findings indicate that procurement efficiency cannot be assessed solely by tender awards or contract compliance but also requires attention to whether textbooks reach schools at the appropriate time and in sufficient quantities. However, the study did not collect administrative delivery records that would allow the researchers to quantify system-wide delivery performance. References to delayed delivery, shortages, textbook sharing and photocopying in this discussion therefore represent reported participant experiences unless explicitly corroborated by the documentary evidence.

Another important finding is the reported relationship between institutional

governance and information flows. Participants described weak communication among schools, regional offices, ministry officials and suppliers and reported inconsistencies between textbook requests, approved quantities and actual deliveries. These accounts point to possible weaknesses in demand forecasting and data management, although the study did not independently audit the underlying administrative records. Interpreted through SCM theory, such information gaps can affect forecasting, inventory visibility, allocation and logistics coordination. The documentary sources provide contextual support for concerns about implementation and coordination, but they do not establish the prevalence of each reported problem across all schools in the region.

The study also provides insights into the role of technological innovation in improving education supply-chain performance. Participants proposed digital procurement platforms, electronic inventory systems, barcode technologies and real-time textbook tracking. The findings indicate that technology should not be viewed as an independent solution capable of resolving procurement inefficiencies. Instead, digital systems can function as enabling tools whose effectiveness depends on institutional readiness, staff competence, reliable infrastructure and supportive governance arrangements. This interpretation follows both the participant accounts and the documentary/literature evidence reviewed in the study.

Stakeholder collaboration and information sharing also emerged from the interview material as important dimensions of textbook procurement and distribution efficiency. The study includes accounts from ministry, regional, school and supplier stakeholders, although the manuscript does not contain theme-level frequency counts sufficient to claim that all groups uniformly reported the same issue. The evidence nevertheless indicates that fragmented communication was associated in participant accounts with duplicated orders, delayed approvals, inconsistent inventory records and inefficient resource utilisation. These reported experiences are consistent with the SCM emphasis on coordinated information flows across the supply chain.

The interview evidence further records calls for stronger government-private supplier partnerships, improved communication across administrative levels and more systematic school involvement in procurement planning. Regional officials specifically emphasised real-time information sharing, while supplier participants raised the effect of delayed government payments on contract fulfilment. School participants reported the practical consequences of textbook availability problems. These different accounts show that the collaboration theme draws on distinct positions within the supply chain rather than a single stakeholder perspective. The findings therefore reinforce the relevance of SCM concepts concerning coordinated decision-making, information exchange and the integration of procurement, inventory and distribution activities.

The findings further raise important equity considerations that extend beyond procurement efficiency. Participants from schools reported differences in textbook availability, indicating that allocation may not always correspond closely

with variations in learner enrolment, school context and logistical capacity. This participant-reported variation suggests that improving textbook access requires attention not only to procurement budgets but also to allocation and redistribution mechanisms. Ensuring equitable access to required learning resources remains an important educational objective, closely linked to curriculum implementation and learner participation. These considerations align with Sustainable Development Goal 4, which emphasises equitable access to quality education through adequate learning resources (United Nations, 2015).

## 10. Conclusion

This study examined strategies for enhancing the efficiency of school textbook procurement and distribution in the Khomas Region of Namibia by exploring existing procurement systems, identifying factors affecting textbook delivery, and proposing context-specific improvement strategies. The interview evidence indicates that participants experienced bureaucratic procurement procedures, fragmented stakeholder coordination, weak inventory management, delayed budget disbursements and logistical challenges as constraints. Participants also reported instances in which textbook availability problems led teachers to share textbooks or photocopy learning materials. Because the study did not include administrative performance data for the entire region, these findings should be understood as evidence of stakeholder experiences rather than as quantified system-wide estimates.

The study further indicates that improving textbook procurement and distribution requires more than increased financial investment. Participants' accounts and the documentary review point to the importance of procurement governance, institutional coordination, supply-chain management and accountability, together with appropriate technological innovations. Integrated digital procurement systems, real-time inventory management, enhanced stakeholder collaboration and evidence-based planning were identified as potential strategies. However, technological innovations require institutional capacity, appropriate decision-making arrangements, continuous staff development and reliable financing. The study therefore concludes that efficient textbook procurement should be approached as an integrated education supply chain in which national oversight is balanced with operational responsiveness and evidence-based planning.

## Recommendations

The study recommends that the Ministry of Education, Innovation, Youth, Sport, Arts and Culture strengthen procurement governance by streamlining procurement procedures, improving coordination among national, regional, and school-level stakeholders, and progressively decentralising selected procurement and distribution functions to regional education offices. Such reforms should be supported by integrated digital procurement and inventory management systems that enable real-time textbook tracking, accurate demand forecasting, and transparent

monitoring of textbook deliveries. These interventions will reduce administrative delays, improve accountability, and ensure that textbooks reach schools before the commencement of the academic year.

Furthermore, sustainable improvements in textbook procurement and distribution require continuous investment in institutional capacity, stakeholder collaboration, and performance monitoring. The Ministry should strengthen the competencies of procurement and logistics personnel through regular training while fostering strategic partnerships with textbook suppliers and other private-sector stakeholders to enhance supply chain efficiency. In addition, a robust monitoring and evaluation framework should be institutionalised to assess procurement performance, promote evidence-based decision-making, and support continuous improvement. Collectively, these measures will contribute to a more efficient, transparent, and equitable textbook supply system that enhances curriculum implementation and improves learners' access to quality educational resources across the Khomas Region.

## Author Contributions

**Onsemus A. Aloovi:** The author contributed to the conceptualisation and design of the study, development of the research methodology, development of data collection instruments, data collection processes, data analysis, and interpretation of the findings. The author also contributed to the preparation, writing, and critical revision of the manuscript and approved the final version for publication. **Nico Sisinyize:** The author contributed to the refinement of the research methodology, review of relevant literature, interpretation and validation of the findings, and critical revision of the manuscript. The author also contributed to strengthening the theoretical and practical implications of the study and approved the final version of the manuscript for publication.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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