



Supply chain challenges in public schools in the uMzinyathi district, KwaZulu-Natal

**Authors:**Nkanyiso Langa¹ Micheline J. Naude¹ **Affiliations:**

¹School of Management,
Information Technology and
Governance, College of Law
and Management Studies,
University of KwaZulu-Natal,
Durban, South Africa

Corresponding author:

Micheline Naude,
naudem@ukzn.ac.za

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Background: The *South African Schools Act* No. 84 of 1996 states that all learners should be provided with a high-quality education and in this way lays a strong foundation for the development of their talents and capabilities. The education sector faces many challenges that undermine the quality of education, particularly in public schools. Unless these challenges are identified and addressed, learners' education will continue to be impacted negatively.

Objectives: This study investigated supply chain challenges in public schools in the uMzinyathi district and explored strategies for managing and addressing these challenges so as to benefit the public education sector as a whole.

Method: The study is exploratory, and a case study approach was used. Data were collected through semistructured interviews with 20 stakeholders in the Department of Education. The stakeholders were selected by means of a nonprobability purposive sampling method. The collected data were analysed using thematic analysis.

Findings: The findings revealed that the main supply chain challenges centre around three themes, namely procurement, service delivery and logistics and demand. These challenges negatively impact on learners' education.

Conclusion: The contribution of this study is twofold. Firstly, it adds to the existing body of literature by identifying the challenges experienced in the country's public education sector, and secondly, the findings and recommendations could be useful in order to address the supply chain challenges faced by public schools for stakeholders in the South African public education sector.

Keywords: South African education sector; supply chain management challenges; department of education; public schools; stakeholders; qualitative approach; thematic analysis.

Introduction and background

The *South African Schools Act* No. 84 of 1996 maintains that all learners should receive a high-quality education that lays a strong basis for the development of their talents and potential. The act establishes a clear structure for the South African educational system, which applies to learners in public schools in society at large (Government Gazette No. 17579 1996:5).

Chapter 2 (s28)(1) of the Constitution of the Republic of South Africa states that every child has the right to education. Education can help people get out of poverty (Howe & Covel 2013:49) and is key for social progress. High-quality education and training are essential in order to contribute to economic growth and development. Children benefit from education because it allows them to reach their full potential (Marishane 2017:2). However, in the South African public education sector, there are large inequalities in educational inputs and outcomes between wealthy and poorer learners (Spaull 2015:35).

Education should focus on the entire development of the human personality, as well as the promotion of human rights and fundamental freedoms. Every child is entitled to receive free education, which is compulsory – at least in the elementary stages. On the basis of equal opportunity, all children should receive an education that will improve their general culture and help them to develop their abilities, independent judgement and sense of moral and social responsibility, thus allowing these children to become productive members of society (Marishane 2017:1; Truter 2015:37).

All sectors, including public schools, rely on processes of supply chain management (SCM), an important business activity that comprises processes such as demand planning, procurement,

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operations and logistics management. It involves the coordination of the flow of materials through procurement, warehousing, distribution, sales and disposal (Chopra & Meindl 2019:16). In public schools, procurement is a vital aspect as it guides the functionality of the public education system as a whole (Masete & Mafini 2018:1). It includes, among other things, the process of acquiring the learner-teacher support materials required by the schools in order to provide the required quality of education or service to the stakeholders (Mbuqe 2020:2).

Supply chain challenges in the public education sector may be defined as challenges that affect the operation of public schools and the Department of Education (DoE) as a whole. Some supply chain challenges faced by the public education sector include the lack of availability of classrooms, desks, chairs, books, adequately trained teachers, department support and management (Chisholm 2013:16). Other supply chain challenges include decisions involving the allocation of resources to various activities within an organisation (Mouton, Louw & Strydom 2013:36).

This study was undertaken at the DoE in the uMzinyathi district. The uMzinyathi district is one of the 11 districts in the northern central region of KwaZulu-Natal and is situated between the N3 from Durban to Gauteng and the East Coast corridor. It is estimated that 80% of the population in this district live in rural areas (Lehohla 2016:19). The uMzinyathi district is divided into four subsections or circuit management centres, namely Msinga, Endumeni, Nqutu and Umvoti, and it contains 479 public schools and six independent schools.

As most of the public schools in the uMzinyathi district are located in remote rural areas, the education and schooling offered here are vastly different from that which is provided in the public schools located in towns and townships. Schools in remote rural areas are relatively underdeveloped, with many lacking the physical resources and basic infrastructure required for sanitation, water, roads, transportation, electricity and information and communication technology. This places learners at a disadvantage and contributes to under-achievement in the affected schools and in turn undermines the learners' constitutional rights and educational aims and goals (Mbuqe 2020:iv). Furthermore, rural schools face severe challenges that are unique to their environment as poverty is rife, and this has serious implications for the provision of quality education (Plessis & Mestry 2019:3).

Problem statement

South Africa is a developing country, and the quality of the public education sector is inadequate (Ambe & Badenhorst-Weiss 2013:254). Recurring challenges include poor assessment outcomes and teacher training, insufficient departmental maintenance and guidance, a lack of physical resources and the provision of teaching and learning materials, all of which contribute to poor academic results (Motuba 2014:25; Truter 2015:5). Mouton et al. (2013:36) concur, noting many

difficulties faced by the South African education sector, such as the shortage of teachers, who are generally also underqualified and may perform poorly. These challenges lead to poor education standards and academic results.

While families in rural areas want to see their children succeed through a formal and effective school system, the majority of public schools are incapable of providing learners with the skills they need to advance to the next grade. The majority of the public schools are in rural areas, and their educational offerings lag behind those of their metropolitan counterparts, with poor academic outcomes pointing directly to poor management in rural schools (Truter 2015:7). Furthermore, in as much as families in rural areas and educational stakeholders believe that schools should serve the interests of the local community, conflict still exists around the purpose of schooling. For example, for families to survive, poor parents subject their children to child labour, and this means that they then may not attend school (Plessis & Mestry 2019:3).

A number of studies have been carried out on the concept of challenges faced by public schools. Ambe and Badenhorst-Weiss (2013) dealt with SCM challenges in the South African public sector. A study by Nene (2013:33) investigated the constraints and challenges in the South African education sector and Muthusamy (2015:50) dealt with teachers' experiences with overcrowded classrooms in a mainstream school. No studies were found that specifically dealt with the supply chain challenges faced by public schools in the uMzinyathi district, KwaZulu-Natal, South Africa. Therefore, this study, by identifying and examining the supply chain challenges faced by public schools in the district concerned, contributes to the current body of knowledge by addressing the gap that exists in the literature. Within this context, the following problem statement was formulated:

There is a lack of information about the supply chain challenges that public schools in KZN face which may undermine the quality of education. These challenges need to be addressed in order to equip learners with necessary skills to progress to the next grade.

Theoretical overview

Overview of the South African school system

Education is promoted and valued in South Africa, as many South African parents are from previously underprivileged backgrounds and did not have access to a good education themselves (Prew 2013:17). Education is acquired through study or through the transmission of knowledge by means of instruction or other practical techniques and affects an individual's reasoning and ability to reach a specific objective in a natural and enduring way (Macha & Kadakia 2017:1).

The South African education sector is regulated by two national departments: (1) the Department of Basic Education, which governs primary and secondary schools, interacting with both public schools and private schools; and (2) the

Department of Higher Education and Training, which oversees university education and vocational training (Mbiza 2018:1).

The public education sector is divided into three categories, namely formal, informal and nonformal education. Formal education is primarily conducted on the premises of a school – it starts in elementary school and continues through high school. Subsequently, higher education is obtained at a university or college and may result in the awarding of an academic degree or diploma (Maddock & Maroun 2018:204). Formal education is provided by means of a learning system and may include learning in classrooms, school grades or certification and structured teaching in various disciplines with a prescribed syllabus (Lewin & Charania 2018:1).

Informal education may be defined as learning that takes place outside of a traditional curriculum and is not provided by a formal educational institution, for example, the process of a parent teaching a child how to cook (Jitpaisanwattana, Pathumcharoenwatten & Tantawathu 2015:945). An informal education can also be acquired by reading books or visiting educational websites.

Nonformal education is offered in a systematic, deliberate and purposeful manner. It includes adult basic education, adult literacy education and school equivalency preparation (Roodt 2018:1).

Levels of the South African public education sector

The education sector in South Africa is divided into three levels, namely elementary, secondary and tertiary (or higher). Elementary or primary education normally covers Grades R through 7, and learners study fundamental abilities such as reading, writing and mathematics (Kasper, Uibu & Mikk 2019:514). Children who receive this level of education gain a variety of skills, including sharing, taking turns, communicating and numeracy skills (Darling-Hammond et al. 2019:99). In addition, these children develop socially and emotionally more quickly than those who do not receive this education. The South African public education sector states that primary education is compulsory and open to everybody; it is free of charge and promotes the growth of learners (Smith & Dawes 2020:764).

Secondary education is delivered by high schools or college preparatory schools. Secondary education usually follows 7 years of elementary or primary school and is followed in turn by higher education (Maddock & Maroun 2018:197). Secondary education includes general and vocational education and must be available for everyone, preparing young people for healthy and productive adult lives that include participation in social, political and economic spheres (Vairamidou & Stravakou 2019:50). Secondary education covers Grades 8–12 of schooling.

All schooling after high school (higher or tertiary education) is the optional final stage of formal instruction and

encompasses all postsecondary education, training and research guidance. It is provided by educational institutions such as universities that have been designated as institutions of higher education by the state (Alyahyan & Dustegor 2020:1; Iqbal & Bhatti 2020:1).

An overview of the types of schools in the uMzinyathi district

The uMzinyathi district has few private schools, being serviced mainly by public schools. In terms of the *South African Schools Act* No. 84 of 1996, there are two categories of public schools, namely Section 20 and Section 21 schools. A Section 20 school (quintiles 1, 2 and 3) is a school that performs the functions listed in Section 20 of the *South African Schools Act* No. 84 of 1996 (Mbuqe 2020:52). These schools do not have the approval to purchase their own goods and services (DoE 2002:28). Because these schools are limited to dealing with suppliers contracted by the DoE, they cannot benefit their schools through being able to select their own appropriate suppliers and thus to negotiate discounts and better prices.

A Section 21 school (quintiles 4 and 5) refers to a school that has been allocated the responsibility of carrying out the functions listed in Section 21 of the *South African School Act* No. 84 of 1996 (Mbuqe 2020:52). These schools receive funds from the DoE and are responsible for purchasing their own stationery and textbooks, paying their own water and electricity bills and covering their own maintenance costs. Section 21 schools are responsible for their own affairs, with the school governing body (SGB) carrying considerably more responsibility for the success of the school (Mbuqe 2020:52; Ndou 2015:154). Their SGB performs more functions and has more responsibility than the SGB of a Section 20 school (Basson & Mestry 2019:2). However, these boards must keep all documentary evidence for audit purposes, including evidence of all dealings with suppliers and contractors and how the materials and services were used (Phakathi 2015:13).

Supply chain management challenges in the South African public sector

Supply chain management is responsible for enabling government to implement policies and procedures across all areas of government in the South African public sector. It is an area that has a direct impact on the efficiency of a business (Republic of South Africa National Treasury 2015:4). Supply chain management is defined as the 'coordination of all parties involved in delivering the combination of inputs, outputs or outcomes that will meet a specified public sector requirement'. These parties comprise the suppliers of materials and services through to delivery and logistics partner organisations and internal corporate service units (Ambe & Badenhorst-Weiss 2011:1102).

Supply chains in the public sector address different focus areas. The focus can differ from government, sector to sector and within the industry. For example, a government sector-to-sector focus area could be in the area of health, where the focus

may be more on logistics and the effective movement of goods and services in and out of hospitals, whereas SCM in the education sector may focus on streamlining the chain through the delivery of teaching materials to students (Ambe & Badenhorst-Weiss 2011:1102). Supply chain management in the education sector performs a strategic role in public schools' ability to deliver on their obligations of service delivery in line with the public education sector (Masete & Mafini 2018:1).

Despite the employment of SCM as a strategic approach, the public sector in South Africa faces various challenges (Ambe, Badenhorst-Weiss, Van Biljon & Cilliers 2022:439). This section provides a list of supply chain challenges experienced by stakeholders in the public sector drawn from various academic texts and articles relevant to the public education sector. These are outlined in Table 1 and subsequently explained in turn.

Lack of proper knowledge, education, training, skills and capacity of SCM personnel

In some government departments, employees' skills and capability are of a poor standard, with a deficiency of knowledge on how to follow purchasing processes (Bolton 2014:24). While many employees in the South African public sector have attended SCM training workshops, a lack of appropriate skills and knowledge remains (Ambe et al. 2022:440), meaning that procurement activities within this sector are handled by personnel who lack the proper knowledge, skills and capacity to conduct conventional value-for-money procurement practices (Mukwevho 2015:127). It is for this reason that the South African government and educational institutions have launched programmes to educate and/or train SCM personnel, but implementation of what has been learned is frequently lacking (Ambe et al. 2022:440).

Noncompliance with SCM policy and regulations

Effective SCM is governed by a number of policies and regulations, and within the public sector, adherence to such policies and regulations is a challenge. A good example of

noncompliance arises in the area of the handling of tenders and bids (Ambe et al. 2022:440), where inadequate controls and procedures are in place, resulting in irregularities (Ambe & Badenhorst-Weiss 2013:250).

Inadequate planning and linking of demand to the budget

Demand management is an important element of an effective SCM process, as it specifies the decision-making process that allows departments to procure at the right time, at the right location and at the right price. Poor demand forecasting and budgeting are a problem for many public entities (Ambe et al. 2022:440).

Accountability, fraud, corruption and unethical behaviour

Fraud and misappropriation of funds within the public sector are rife in South Africa. An example of unethical behaviour occurs when a procurement official discloses information on bid quotations to preferred suppliers so that the latter is able to quote more favourable prices and thereby be awarded the contract (Glover 2014:20). While the National Treasury provides a guide for accounting officers with a model approach to the SCM process, compliance and application of the procedures are unfortunately lacking (Motuba 2014:28). As such practices are difficult to control, unethical behaviour arises, undermining procurement practices in many public sector organisations (Ambe & Badenhorst-Weiss 2013:251).

Lack of knowledge and information-sharing between departmental officials

The management of information is critical when it comes to the effective handling of SCM. One of the most important variables affecting the effectiveness of any supply chain operation is the flow of accurate information (Hennessey & Heryer 2013:1). While there are constraints with information-sharing, there are also issues in terms of information availability (Kajtazi 2013:321). For example, some members of senior management do not share appropriate and relevant information with subordinates (Rambiyana 2015:5). Rexhepi (2018:81) posits that if appropriate information is provided to all officials within a department, the operations in the public sector should improve.

Long processes and procedures

Entities in the public sector face delays because of the long procurement processes and procedures, and these result in longer lead times (Motuba 2014:29). The definition of a lead time is the time between when an order is placed and when it is delivered (Li et al. 2019:1).

Lack of top management commitment, organisational encouragement and support

Top management commitment and support are key for the successful implementation of any strategic programme (Zhu & Sarkis 2013:121). Top management should continually guide and support the employees in all the activities they perform within an organisation (Joseph 2015:63; Tzempelikos 2015:32). The function of senior management is to motivate subordinates to participate effectively in public sector operations.

TABLE 1: Supply chain challenges in the South African public sector.

Supply chain challenges	Section and source
Lack of proper knowledge, education, training, skills and capacity of SCM personnel	Ambe et al. (2022:439), Bolton (2014:24), Mukwevho (2015:127)
Noncompliance with SCM policy and regulations	Ambe et al. (2022:440)
Inadequate planning and linking of demand to the budget	Ambe et al. (2022:440)
Accountability, fraud, corruption and unethical behaviour	Ambe and Badenhorst-Weiss (2013:251), Ambe et al. (2022:441), Glover (2014:20), Motuba (2014:28)
Lack of knowledge and information-sharing between departmental officials	Great Schools Partnership (2015:1), Hennessey and Heryer (2013:1), Kajtazi (2013:321), Rambiyana (2015:5), Rexhepi (2018:81)
Long processes and procedures	Li et al. (2019:1), Motuba (2014:29)
Lack of top management commitment, encouragement and support	Joseph (2015:63), Tzempelikos (2015:32)
Transportation challenges	Evren and Akad (2019:796), Hasselgren and Tore (2016:540)
Demand uncertainty	Chopra and Meindl (2019:190), Hou and Zhao (2013:5775)
Insufficient resources	Great Schools Partnership (2015:10)

SCM, supply chain management.

Transportation challenges

The public sector experiences challenges in delivering goods and services that are required by stakeholders (Hasselgren & Tore 2016:540), and these transportation challenges often lead to high transportation costs (Evren & Akad 2019:796).

Demand uncertainty

One of the most important factors influencing supply chain efficiency is accurately forecasting demand. All organisations need to compile accurate demand forecasts, as any uncertainty in the supply chain may lead to difficulties (Hou & Zhao 2013:5775). As a result, organisations are constantly working to improve and strengthen their demand forecasting systems to eliminate such difficulties.

Insufficient resources

In South Africa, resources are often inadequate, with poor infrastructure existing in many areas. This applies to the public education sector where, for example, there is a lack of electricity and water in many public schools and poor transportation channels. Insufficient resources and the inadequate provision of goods, services and other facilities required by a school undermine the quality of education provided (Great Schools Partnership 2015:10).

Research methods

The purpose of this article is to identify the supply chain challenges in public schools in the uMzinyathi district that undermine the quality of education in that district. A case study approach was deemed appropriate for this study, as this approach focuses on collecting information from a particular business unit or business, a group of individuals, an event or a situation, with the purpose of the approach being to create a picture of a real-life event that can be analysed from a variety of angles and perspectives, utilising a variety of data collection methods (Sekaran & Bougie 2016:98). For this study, a case study approach was used as it focuses on current events – the identification of supply chain challenges in public schools in the uMzinyathi district – and it would not have not been feasible to use any other designs (Yin 2018:4). The target population in this study refers to all the individuals who are permanent members of staff and work in the DoE in the uMzinyathi district of KZN. The uMzinyathi district has seven administrative offices, that is, four circuit management centres in each local municipality, two district offices located in Dundee that deal with district administration issues and one education centre, regarded as the main meeting place in the district for departmental officials. There are approximately 640 schools. These institutions are staffed by approximately 12 000 employees, with 80% of them being educators (KZN DoE Maintenance Strategy Final Signed 2016:3). A nonprobability purposive sampling methodology was found to be suitable for selecting the stakeholders who are relevant to the DoE and who make up the value chain of the public education sector. A total of 20 participants in the DoE were selected to participate in this study.

Primary data were collected through face-to-face semistructured interviews, using an interview guide. The interview guide was checked for content validity as part of the ethical clearance procedure by various academics. The aim was to fine-tune the questions in order that participants would be able to answer them without difficulty, as well as ensuring the validity of the questions in order that the data collected would be reliable. The interviews were recorded, transcribed verbatim and the data cleaned for accuracy to ensure its trustworthiness. The data were analysed using thematic analysis. Ethical clearance through (location masked for blind) was obtained. All participants had considerable experience in the education sector. Table 2 presents the list of participants, a pseudonym being used for each participant to ensure anonymity.

Twelve of the participants (eight from primary schools, three from combined schools and one from a secondary school) are school principals, two are deputy principals (one from a primary school and one from a combined school), one is a teacher (combined school) and three are administration clerks in the schools. Two participants are based in the DoE office – one is the circuit manager and the other an SCM, procurement and asset management clerk.

Findings and discussion

All participants had a sound understanding of the SCM challenges they face in public schools in the uMzinyathi district. Table 3 summarises the findings on SCM challenges according to the thematic analysis of the interviews, in the form of a thematic map comprising three themes, subthemes and codes.

Theme 1: Procurement challenges

The procurement challenges theme has three subthemes identified from the research results. These are delays in the procurement process, issues with schools under Section 20 and issues regarding the allocation of funds to schools under Section 21. These are dealt with below.

Delays in the procurement process

Delays in the procurement process may be explained as any constraints that hinder procurement from taking place in line with the procurement plan and timetable. Failure to start the procurement process timeously could generate delays throughout the public school system. It was found that department officials cause delays within the procurement process, negatively impacting on the public education sector. This finding is in line with the literature that identified that delays in the procurement process negatively impact on the public sector (Motuba 2014:29). A reason to which the delays in the procurement process of goods and services may be attributed could be a lack of staff training. The findings revealed that staff in the Department of Education require training, as they lack knowledge regarding new SCM methods, policies and procedures.

TABLE 2: List of participants.

Participant pseudonym	Gender	Position held	Department or institution pseudonym†	Type of school	Highest qualification
Participant A	Male	School Principal	CS1	Section 21	Undergraduate Degree
Participant B	Male	Teacher	CS1	Section 21	Undergraduate Degree
Participant C	Male	School Principal	PS1	Section 21	National Diploma
Participant D	Male	Administration Clerk	PS1	Section 21	Undergraduate Degree
Participant E	Male	School Principal	CS2	Section 21	National Diploma
Participant F	Female	Administration Clerk	CS2	Section 21	Matric
Participant G	Male	School Principal	CS3	Section 20	Master's Degree
Participant H	Female	Administration Clerk	CS3	Section 20	Undergraduate Degree
Participant I	Female	School Principal	SS1	Section 20	Honours Degree
Participant J	Female	School Principal	PS2	Section 20	Undergraduate Degree
Participant K	Male	School Principal	PS3	Section 20	Undergraduate Degree
Participant L	Male	School Principal	PS4	Section 21	Honours Degree
Participant M	Female	School Principal	PS5	Section 20	Undergraduate Degree
Participant N	Male	School Principal	PS6	Section 21	Honours Degree
Participant O	Male	School Principal	PS7	Section 21	Undergraduate Degree
Participant P	Male	Deputy Principal	CS4	Section 20	Honours Degree
Participant Q	Male	Deputy Principal	PS8	Section 21	National Diploma
Participant R	Male	Circuit Manager, Departmental Official	D1	-	Master's Degree
Participant S	Female	Supply Chain, Procurement and Assets Management Clerk, Departmental Official	D2	-	Undergraduate Degree
Participant T	Female	School Principal	PS9	Section 21	Honours Degree

† CS, combined school; PS, primary school; SS, secondary school; D, DoE office. A combined school is a public school that provides primary and secondary education.

TABLE 3: Thematic map of the interviews.

Theme	Subthemes	Codes
Theme 1: Procurement challenges	Delays in the procurement process	• Untrained employees
	School under Section 20	• Placing orders or requisitions
	Schools under Section 21 – allocation of funds	• Excessive pricing
Theme 2: Service delivery or logistics challenges	Transportation challenges	• Late release of allocation
	Dishonest service providers	• Inadequate funding
	Wrong items or stock	• Rural area or location
	Time frame	• Shortage of materials ordered
Theme 3: Demand management challenges	Long processes and procedures	• Quality of items or goods delivered
	Higher expectations	• Deliveries made after office hours
		• Empty promises
		• Failure of the stakeholders

The findings also revealed that delays in the procurement process are sometimes caused by the service providers:

‘Sometimes the service provider has got less money and breaks orders into small quantities, which delays the delivery of the items. This delays the whole process of getting the goods on time.’ (Participant G, male)

As noted by Li et al. (2019:1), delays or long lead times in procurement mean that goods and/or services will not be delivered on time. When the suppliers or service providers lack financial resources, it delays the whole process of receiving the goods on time, as they may need to borrow money to be able to render the service required. Thus, financial constraints may cause the supplier or service provider to increase delivery lead time.

Untrained employees: Two participants who deal with the DoE administrative side identified that employees in the DoE lack knowledge regarding new strategies, policies and

procedures in the SCM department. Furthermore, the findings revealed that it appears that the directorate and senior departmental officials failed to employ the most suitable candidates for the positions in the supply chain department:

‘The problem we have in our office is that management in the supply chain department failed at the beginning to take the best suitable candidates to deal with the supply chain management department. Most of the people who are in supply chain management do not qualify to be in that office; they are not well trained. That’s why we are facing so many delays.’ (Participant S, female)

‘The Department of Education needs to formulate and host workshops that would train departmental officials for better outcomes in the Department of Education.’ (Participant R, male)

This challenge was identified also by Mukwevho (2015:127), who found that staff in the procurement department within the public sector lack the proper knowledge, skills and capacity to conduct conventional value-for-money procurement practices.

Schools under Section 20

The participants from schools under Section 20 explained that when they require particular items or facilities, they send a requisition to the DoE. Thereafter, the DoE arranges for the purchases and deliveries.

Placing orders or requisitions: Many of the schools in the uMzinyathi district are under Section 20. They have no choice when it comes to selecting suppliers, as a requisition is sent to the DoE:

‘Since we are Section 20 school, the Department of Education places orders for us. We send a requisition by writing down a list

of goods or materials we require to the Department of Education. The list we compile is according to the priorities of materials we require, and the Department of Education places orders for us.' (Participant J, female)

'We have no choice of determining quotations as Section 20 schools; we have no right to choose companies of our choice and procure from them. There are no comparable quotations given to the schools or institutions before placing orders. The quality of goods or services is not guaranteed from the agent.' (Participant K, male)

Furthermore, there is poor communication between the school and the DoE:

'The Department of Education does not inform schools about deliveries that are going to take place. The communication from the Department of Education is very poor.' (Participant K, male)

Excessive pricing: The participants identified the challenge of service providers overcharging. The findings revealed that when schools under Section 20 order from the DoE using the allocation of the 'supplementary' learning and teaching support materials (LTSMs), the prices are excessive (refer to verbatim quotations below by Participant I), and the schools do not understand why this is so. Learning and teaching support materials are an integral and vital part of every education sector, and the effective management, utilisation and maintenance of these resources are key to ensuring access and support of the delivery of quality education:

'When the materials are delivered to the school the prices are way too high. For example, at some point I have included dictionaries as part of my order to the Department of Education, only to find that the cost of one dictionary was R895.00. When you do your own quotation, the cost of the same dictionary was R199.00 and the highest price was R220.00.' (Participant I, female)

'At some point, we asked to have two laptops for departmental heads, only to find that the price for the two laptops was R24 000.00, meaning each laptop was R12 000.00. When you go to Game Store where you can purchase the same laptop, the cost was R4500.00.' (Participant I, female)

Most of the participants stated that the DoE is misusing the allocation of funds for the school by overcharging. Learning and teaching support materials are important for driving effective classroom teaching and learning (Milligan et al. 2018:1). The LTSM expenditure in Section 20 schools is controlled by the district office. In the allocation for this expenditure, the district office takes 30% of the school allocation and 'reserves' an amount under the heading 'supplementary' LTSMs, retaining this at the district office for use at their discretion, such as buying assets like laptops at inflated prices:

'The main challenge is that if you purchase a laptop, desk or textbooks using that "other" LTSM amount it will be more than 200% profit. For example, you purchase a laptop that cost around R6000.00 using the "other" LTSM amount, and they will charge around R16 000.00. Same applies to desks. Each desk costs around R400.00, but when you buy from it, will cost R2800.00. There is no one who is controlling this high amount.' (Participant G, male)

The circuit manager as the departmental official also mentioned that the prices within the DoE are excessive:

'When you happen to look at the pricing, you find that some of the prices are doubled if not tripled in terms of items that are given to us. When you look at the pricing, sometimes you become shocked that you can buy an item at any shop for R5.00 but from our department, you may end up receiving the same item buying it at R35.00.' (Participant R, male)

Schools under Section 21

Section 21 schools receive funds from the DoE and are responsible for ordering stationery and textbooks, paying utility bills and maintenance. Because of schools' proven capability, knowledge and expertise, they are given increased responsibilities. The SGB's ability to undertake Section 21 functions is conditional on their doing so successfully (Ndou 2015:154). In the uMzinyathi district, there are some Section 21 schools. These schools are in charge of their operations in terms of procurement. The allocation of funds for the school goes straight into the respective schools' bank accounts.

Participants in this study explained that they prepare and analyse quotations together with their SGB members and place orders. A quotation is a document that a supplier or service provider sends to a potential client that includes a proposed price for the supplier's goods and services based on certain terms and conditions. Once the quotations are received, they are analysed and agreed to, and orders are placed.

One participant explained the process of how they procure goods and services in their school:

'We are a primary school under Section 21, so we buy goods and services or any other resources on our own. We need to invite quotations – three quotations, so we are able to identify or choose the best service provider who we think will give us the quality and the quantity that we require.' (Participant N, male)

One participant explained the measures or operations involved in procuring the goods and services:

'As the principal, I also serve on the finance committee that is responsible for procurement in the school. The school is under Section 21, whereby we are able to purchase from a variety of suppliers. We have a right to buy from any supplier.' (Participant O, male)

Even though these schools have their internal supply chain arrangement, all government entities are guided by the regulations and procedures of SCM (Ambe et al. 2022:440). The DoE has a policy stating that in order for SCM to be fair and transparent, at least three quotations are required from service providers, and the best suitable service provider that meets specifications must be selected. Furthermore, while Section 21 schools are responsible for their own purchases, SGBs must keep all documentary evidence of any dealings with suppliers, service providers and contractors, as well as records of how the materials and services were used for audit purposes (Phakathi 2015:13).

The findings revealed that schools under Section 21 also face various SCM challenges. The following subsection presents some of the identified challenges.

Allocation of funds: The Department of Basic Education allocates funding to the public education sector in order for it to function. Funds are allocated by the government to an institution or a school, based on the number of learners enrolled in the institution, and without the allocation of funds, schools will not survive nor be able to function.

It was found that public schools have concerns regarding the allocation of the funding from the DoE because the resources and facilities they require exceed the funding received:

'Schools under Section 21 with function C are better off in terms of procurement, even though the funds that are allocated to schools are not enough to procure what is required.' (Participant A, male)

Late release of allocation: The late release of allocation (funding) was identified as a challenge. When the allocation of funds is delayed by the DoE, schools have to wait for this funding in order to procure the required resources for the school. This will result in schools not having enough resources and materials needed to teach – for example, not enough textbooks to cover the curriculum and not available on time. Learners are then left behind in terms of the essential coverage of the syllabus and curriculum, and this negatively affects their learning and education:

'The late release of funding becomes a problem because we don't get funding on time. Therefore, the later we receive the allocation of funds into the school account, the later we start with our procurement processes and procedures.' (Participant N, male)

'The challenge starts when the money is not deposited into the school account. We cannot procure the materials if we don't have money. The delays are caused by Department of Education by not releasing the funds to the school account on time.' (Participant Q, male)

Inadequate funding

The findings revealed that insufficient funding is a key challenge which results in schools not being able timeously to procure goods and services or facilities that are needed by the school. If schools do not have enough funding to procure the required resources and learning materials for the school, it will negatively impact learners' education:

'As the school principal, it is better to run the school efficiently and effectively, because failure to do so will be a disaster. As the manager of the school, you have to be proactive, even though the funding allocated to the school is not enough.' (Participant A, male)

'As a school, if we don't have enough money, that will hinder the quality of education. We won't be able to procure enough resources for our school to function efficiently and effectively.' (Participant N, male)

'We have strategies to utilise the funding which the Department of Education provides. The funding is always insufficient,

compared to the needs that we have as the school.' (Participant O, male)

Insufficient resources such as the provision of goods and services and other facilities required by a school negatively impact on teaching and learning (Great Schools Partnership 2015:10).

Theme 2: Service delivery and logistics challenges

The service deliver and logistics challenges theme has four subthemes identified from the research results. These are transportation challenges, dishonest service providers, wrong items or stock and time frame. These are dealt with in turn below.

Transportation challenges

The findings revealed that participants had experienced the effects of transportation challenges:

'The suppliers do not have enough transportation when it comes to delivering textbooks that are required by the school, because they mentioned these books are being ordered from different destinations. So that causes delays in terms of deliveries.' (Participant C, male)

'There are delivery delays because transporters face some difficulties to locate the school.' (Participant D, male)

The public sector experiences challenges when it comes to delivering the goods and services required by stakeholders. This is in line with the existing literature (Hasselgren & Tore 2016:540).

Rural areas and location

It was found that some service providers find it difficult to find the schools in rural areas where they have to make deliveries:

'We are located in rural areas, and the supplier takes a long time to deliver and even to find the place where the school is located. Access is hard.' (Participant D, male)

'There are a lot of inconveniences when it comes to transportation for deliveries. You find that the goods are delivered to our neighbouring school, where we have to go and collect. You may have a challenge of getting transportation to pick up those goods.' (Participant K, male)

'You find the service provider telling us that he has procured what you have requested, but the transport that he has cannot access your place because you are situated in a rural area. I then have to request other business partners to help, those who have transport that can easily get to your school.' (Participant L, male)

Location is a key challenge when it comes to deliveries:

'You may find that the supplier does not have the correct physical address where deliveries have to be made.' (Participant R, male)

'As a rural area, our main challenge is road in terms of transport. Most suppliers are having problems. Beside the road, the location of the area, because maybe you are unable to find that place in the global positioning system.' (Participant P, male)

Dishonest service providers

The findings revealed that some service providers are not trustworthy, which poses a challenge:

'Suppliers are not trustworthy. Sometimes they deliver broken goods, so you end up taking whatever is broken and you will fix it because of the delivery that is poor.' (Participant R, male)

'Other service providers use catalogues to trick school principals' minds, which is unethical. When the material is delivered, maybe the quantity or quality is not the same because you said you want 10 poles in a line, and you find that there are 8 poles in a line.' (Participant T, female)

This finding is in line with the literature that indicates that some of the suppliers are not trustworthy and that their behaviour is unethical (Ambe & Badenhorst-Weiss 2013:251). Furthermore, there is poor service delivery from the service providers, as they make promises but often fail to keep them:

'You get a call stating that goods will be delivered to your school on certain day, only to find that after a month the goods are not yet delivered.' (Participant A, male)

'Sometimes it happens that the quantity of goods written on the invoice is not matching the goods received.' (Participant H, female)

Shortage of materials ordered: Service providers frequently do not fulfil orders because of nonavailability of stock on hand, thus leaving orders incomplete. This appears to happen mainly in schools or institutions under Section 21, where the school is directly involved in its own procurement processes and procedures. When an order is incomplete, it affects teaching and learning in schools:

'There is a great problem in terms of deliveries: the book shop doesn't give enough stock to suppliers; they have to wait; that's why they don't deliver on time.' (Participant E, male)

'It just that they give us incomplete orders of what has been ordered.' (Participant F, female)

'They used to deliver shortage of items ordered when it comes to textbooks and workbooks in the school.' (Participant H, female)

'They don't deliver on time, and also the stock is not enough from the things that we ordered from.' (Participant M, female)

One of the participants stated that at the beginning of the COVID-19 pandemic, some service providers used the pandemic as an excuse for nondelivery:

'They make promises, and they would apologise for not keeping their promises and say, "As you know, we are under COVID-19 pandemic, so many things are not happening as they should."' (Participant O, male)

Wrong items or stock delivered

With regard to all public schools under Section 20, it was found from the participants that poor service delivery is a challenge. Furthermore, the principals do not know who to consult when incorrect items are delivered or deliveries are late or delayed, as they do not know who in the DoE is responsible for the order:

'We don't even know who to consult in terms of these late deliveries and wrong items delivered, and that is time consuming.' (Participant I, female)

'The service provider delivered the wrong textbooks and workbooks in Afrikaans.' (Participant H, female)

Quality of items or goods delivered

The quality of goods delivered is another challenge identified in this study. The schools or institutions order goods or services from catalogues given by the service providers to the principals. The findings revealed that items listed in the catalogues are ordered, but when these items are delivered, they are different from those in the catalogues:

'We experience a challenge with service providers who are supplying schools. Sometimes you give them the specifications of what you want, maybe giving a brand. For example, asking for a desk of certain material or brand. When they deliver, you do not notice because the delivered goods look the same. When the time goes by, the life span of what was delivered is totally different to the life span of items that were ordered.' (Participant T, female)

'Sometimes quantity, quality and under-quoting are the main challenges. For example, you want somebody to do fencing for you. You come up with a specification of material and requirements, and the service provider under-quotes. When you discuss with the supplier you find that he or she under-quoted, and thus the quality of the product is not met.' (Participant T, female)

Time frame

Two participants explained that the managing agent from the DoE who supplies schools with textbooks fails to meet the time frame in terms of delivery, with deliveries always being late:

'The service providers fail to meet our time frame because the bookshop does not give them enough stock. They have to wait, and that's why they don't deliver on time.' (Participant E, male)

'I would like to say something with regard to time frame. When we send out our requisitions, we do them early in the year for the following academic year, only to find that goods are delivered in November. That's how we manage our time frame as the school.' (Participant I, female)

This is in line with the work of Hou and Zhao (2013:5776), who noted that all public entities need to put together accurate demand forecasts as uncertainty in the supply chain is a challenge.

The findings revealed that orders are placed well in advance. For example, the participants indicated that they may place orders in January 2021, yet these orders are only delivered during November 2021, in time for the following academic year:

'The Department of Education determines only the month, but there is no time frame in terms of date and time.' (Participant K, male)

'Again, the issue of time frame comes in, because we do have a time stipulated as to when these goods or resources should be delivered, at a certain time and date. But they don't meet that. They fail to comply with the time frame.' (Participant N, male)

Deliveries made after office hours: Four participants stated that some service providers make deliveries after office hours. This becomes a challenge, as someone is required to wait to receive these deliveries:

'Only to find that the service provider will arrive after hours. It becomes a challenge for you, waiting for somebody that you don't know, and office hours are no longer permitting you to be in the office by that time.' (Participant R, male)

'You can find that goods are delivered in December for the following year whilst we are not at school. The service provider asks the principal to make arrangements for someone to receive these goods. Sometimes suppliers deliver after hours, while we are out of school. Therefore, I have to request someone who is from the community to come and receive the goods on my behalf.' (Participant I, female)

Theme 3: Demand management challenges

The findings of the study revealed that most of the requirements of the participants are not met by the DoE for various reasons, such as demand exceeding supply.

Long processes and procedures

The long process of procuring goods and services for the schools hinders teaching and learning, as they have to wait for books that have been procured to be delivered. One participant stated that even for schools under Section 21, there is a long process involved in procurement, which includes the school management team, the school governing board and the finance committee within the school:

'This long process is hard. Even if we are trying to access something quickly or we need it, we cannot because of these processes involved.' (Participant L, male)

This is in line with the findings of Motuba (2014:29), who found that the public faces many delays because of the long processes and procedures that take place in procurement.

Empty promises: There are many varying demands arising in the schools, and when they are reported to the DoE, the department seems unwilling or incapable of fulfilling them. In many cases, the DoE makes only promises until the schools lose patience and give up:

'Sometimes we don't get any response from the Department of Education, and they tell you that you are on the waiting list in order to fulfil your demands.' (Participant T, female)

'The departmental officials will tell you to wait to have your order delivered. Sometimes you don't get your order at all.' (Participant S, female)

'They are many promises that are not yet kept.' (Participant A, male)

Higher expectations

Public schools expect the DoE to offer more in terms of funding. The findings revealed that participants' needs and requirements are higher than the funding that is allocated:

'The needs of the school are more than what is allocated in terms of funding; the demand is higher than the supply.' (Participant O, male)

Failure of the stakeholders: The failure of the stakeholders from the public education sector to effectively support the schools was identified as a challenge:

'In this school, we use a router for network or Internet. The storm damage happened, and our network has been destroyed. We asked the Department of Education to come and assist and fix it. Until now, there is nothing since 2019.' (Participant E, male)

'The chairs are getting broken each and every time, but yet we don't have enough funding so to replace them, but we are trying our best.' (Participant N, male)

Limitations and suggestions for future research

This study is not without its limitations. Firstly, a qualitative approach was used. The study was limited to 20 participants from one rural district in the uMzinyathi district. As a result, the findings of this study and any conclusions and recommendations made may not be representative of or relevant to all South African public schools. Therefore, it is suggested that a quantitative study be undertaken to include more stakeholders in the public education sector in South Africa.

Secondly, while a number of SCM challenges were identified by the 20 participants in the uMzinyathi district, it is likely that not all the supply chain challenges have been identified in this study.

Thirdly, the service providers, who are important stakeholders in the supply chain processes, were not included in the study. They may be partly responsible for the supply chain challenges that public schools face. As their experiences when dealing with the DoE are not reported on, it is suggested that a future study be undertaken to include all the stakeholders in the public education sector and to identify the supply chain challenges that all stakeholders face.

Conclusion and recommendations

The purpose of this study was to identify the supply chain challenges faced by public schools in the uMzinyathi district. A qualitative case study was conducted. Data were collected through in-depth semistructured interviews with 20 participants at 14 public schools within the district. The findings revealed that the main supply chain challenges centred around three themes, namely procurement challenges, service delivery or logistics challenges and demand challenges. These challenges negatively impact on learners' education. The study recommends that the public schools should be directly involved in the procurement

processes to avoid any delays, shortages and overpricing, among other challenges. The study also recommends collaboration in forecasting to allow aggregation of demand and some form of consolidation to facilitate efficient distribution. Furthermore, communication around supply chain challenges faced by public schools between DoE and school principals needs to be improved. Lastly, it is suggested that detailed specifications, the selection and performance monitoring of suppliers could bring significant benefits. However, it is important that the implementation of these processes does not result in excessive administrative overheads or corrupt practices.

While this study identified the SCM challenges faced by 14 public schools within the uMzinyathi district, a future study could extend to all stakeholders in the area or to all stakeholders in the DoE in South Africa. This would provide knowledge about the extent of the identified SCM challenges and identify additional SCM challenges under different circumstances. It could suggest how the public education sector and public schools could address the identified supply chain challenges faced by the schools.

It is suggested that the research study contributes to the public education sector and public schools in the uMzinyathi District in KZN with regard to the supply chain challenges that schools experience. The study also contributes to the field of SCM, particularly supply chain challenges in the public education sector in KZN. The study findings highlighted the areas that result in inefficiencies in the education sector. If these areas are addressed, it could improve the education sector in the study district.

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Competing interests

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Authors' contributions

The research methodology and findings are derived from the master's study of N.L.; M.J.N. was the project leader, made conceptual contributions and finalised the article and N.L. collected and analysed the primary and secondary data and wrote up the literature review.

Ethical considerations

Ethical approval to conduct this study was obtained from the Humanities and Social Sciences Research Ethics Committee of University of KwaZulu-Natal (ref. no. HSSREC/00002134/2020).

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Data availability

The data that support the findings of this study are available from the corresponding author, M.N. upon reasonable request.

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