UNIVERSITY OF KWAZULU-NATAL

Knowledge transfer in institutionalised supplier development and organisational performance: Evidence from the construction industry in Zambia

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School of Management, IT & Governance

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DECLARATION

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GLOSSARY OF ACRONYMS

7NDP	7th National Development Plan
AC	Absorptive Capacity
CEEC	Citizen Economic Empowerment Commission
CIDB	Construction Industry Development Board
CMV	Common Method Variance
EPA	Exploratory Factor Analysis
EU	European Commission
GDP	Gross Domestic Product
GRZ	Government of the Republic of Zambia
ISD	Institutionalised Supplier Development
KT	Knowledge Transfer
MCTI	Ministry of Commerce Trade and Industry
NCC	National Council for Construction
NRB	Nonresponse Bias
NRFA	National Road Fund Agency
OECD	Organisation for Economic Co-operation and Development
PCA	Principal Components Analysis
R&D	Research and Development
RDA	Road Development Agency
SDGs	Sustainable Development Goals
SME	Small and Medium Size-Enterprises
UK	United Kingdom
UN	United Nations
UNCITRAL	United Nations Commission on International Trade Law
USA	United States of America

ABSTRACT

Globally, the economic rationale for supporting SMEs using public procurement policy is well acknowledged and justified. Public procurement policy can be implemented directly through institutionalised supplier development initiatives such as Preferential and Reservation schemes, financial support, subcontracting and training. However, the efficacy of these initiatives on knowledge transfer and performance improvement are still underexplored. The purpose of the study is to examine the effect of knowledge transfer from institutionalised supplier development initiatives on the operational performance of local contractors. The study also investigates the mediating role of absorptive capacity on the relationship between knowledge transfer and operational performance. Additionally, the research investigates the moderating effect of institutional factors on the relationship between institutionalised supplier development initiatives and knowledge transfer. The study used a mixed-method strategy, consisting of nine expert interviews and 171 questionnaire responses from local contractors in Zambia.

The qualitative findings revealed that the implementation of institutionalised supplier development is strongly affected by institutional factors such as political influence and favouritism, corruption, inadequate procurement regulatory regime, weak institutional oversight, and monitoring systems. However, the initiatives contributed to information dissemination and knowledge transfer. The survey findings established that direct institutionalised supplier development, such as the 20 per cent subcontracting policy and training, were significantly associated with knowledge transfer. However, the association between indirect institutionalised supplier development such as the Construction Finance Initiative, Preferential and Reservation schemes and knowledge transfer was insignificant.

Furthermore, the study demonstrated that knowledge transfer indirectly improves the local contractor operational performance through overall absorptive capacity. Additionally, regulatory compliance and government support moderate the relationship between institutionalised supplier development and knowledge transfer. Moderation interactions indicated that low regulatory compliance is associated with high knowledge transfer, while government support is associated with high knowledge transfer at all levels.

The research advances a more nuanced understanding of the influence of absorptive capacity and institutional factors in implementing institutionalised supplier development using evidence from the construction industry in Zambia. The study proposes a number of recommendations to the top management of construction companies and the government.

Keywords

Knowledge transfer, Institutionalised supplier development, Absorptive capacity, Institutional factors, operational performance, SME procurement policy, Construction Industry

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CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1 Introduction and context

Supplier development is a crucial aspect of supply chain management practice. It facilitates the management of the buyer-supplier relationship beyond contractual obligations (Benton, Prahinski and Fan, 2020). Supplier development is any deliberate attempt by the purchasing organisation to improve the performance and capabilities of the supplier, and thereby contribute to the supply needs of the purchasing organisation (Krause, Scannell and Calantone, 2000; Handfield *et al*., 2000; McKevitt and Davis, 2014; Glock, 2017). Furthermore, Chen, Ellis and Holsapple (2018) extend the definition of supplier development as a set of knowledge management activities that are carried out by both the buyer and supplier. They are designed to meet the supply needs of the buying organisation by facilitating continuous performance and capability improvements.

Supplier development covers a broad range of activities, which include training, technical assistance, supplier evaluation, investing resources in the supplier organisation, and the sharing of equipment and information, in order to improve supplier performance (Modi and Mabert, 2007; Sucky and Durst, 2013; Sancha, Longoni and Giménez, 2015; Sillanpää, Shahzad and Sillanpää, 2015; Chen, Ellis and Holsapple, 2015; Benton, Prahinski and Fan, 2020). Additionally, Chen, Ellis and Holsapple (2018) add that supplier development consists of knowledge management activities that facilitate the flow of knowledge from the buying organisation to the supplier for performance improvement.

Supplier development as a company strategy has achieved success to a certain degree, in many companies, such as Toyota (Marksberry, 2012) and Hyundai Motor Company (Kim, 1998). The critical role of supplier development in the private sector can also be extended to public procurement beyond the usual dyadic, buyer-supplier level, by including the role of government as an important regulator, facilitator, and critical stakeholder. The public procurement-oriented supplier development is commonly referred to as institutionalised supplier development initiatives (ISD). ISD initiatives are government programmes aimed at improving the interaction between local suppliers and relatively large organisations through various policies (Arráiz, Henríquez and Stucchi, 2013; Cravero, 2018; Flynn, 2018).

The value and volume of public procurement make it a key lever for supporting ISD initiatives (Asamoah, Annan and Rockson, 2019; Saastamoinen, Reijonen and Tammi, 2021). For example, the sector represents about 12 per cent of global Gross Domestic Product (GDP) and more

than 20 per cent for developing countries (OECD, 2017; Patil, 2017; Asamoah, Annan and Rockson, 2019). The public procurement sector has become an important sector for stimulating and sustaining socio-economic objectives (Hawkins, Gravier and Randall, 2018; Asamoah, Annan and Rockson, 2019). Against this backdrop, public procurement is recognised globally as a critical policy tool for stimulating socio-economic development in different sectors of the economy. However, despite its essence, Grandia and Meehan (2017) argue that the sector remains under-researched, particularly in developing countries.

Furthermore, public procurement as a tool for socio-economic development is fast-growing and receiving considerable research attention in supplier development (Arráiz, Henríquez and Stucchi, 2013; McKevitt and Davis, 2014; Patil, 2017). Nevertheless, research suggests a need for more empirical research to investigate the effectiveness of ISD initiatives coordinated by the central government and its quasi-autonomous institutions through public procurement policies (Arroyo-López, Holmen and de Boer, 2012; Arráiz, Henríquez and Stucchi, 2013; McKevitt and Davis, 2014). The research calls are themed around the role of small and medium-sized enterprises (SMEs) in economic development using SME oriented public procurement policies (Patil, 2017; Hawkins, Gravier and Randall, 2018).

The main objective of SME oriented public procurement policy interventions is to ensure a diverse and competitive supply market to contribute to a more innovative, sustainable, inclusive and competitive economy (Cravero, 2018). However, despite the increasing support by governments to SMEs through public procurement, the buyer-SME supplier interactions ignore the role and impact of knowledge transfer (KT) in the process. Szulanski (1996, p.28) defines KT as a "dyadic exchange of organizational knowledge between a source and a recipient unit." In supplier development, KT is conceptualised as a relational mechanism by which a buying organisation, which is more experienced with advanced knowledge management systems, influences a supplying organisation through access to and acquiring external knowledge (Squire, Cousins and Brown, 2009; Wagner, 2010). The exchange of organisational expertise, skills and experience between the purchaser and the supplier (Zhao, 2013) aims, in turn, to enhance the performance of the parties involved.

In the private sector, investigations have shown that supplier development has had a positive influence on KT and subsequently on performance improvement (Modi and Mabert, 2007; Gosling *et al.*, 2015). Some studies have, however, questioned the effectiveness of KT in public-funded construction projects due to the unique contextual challenges of construction supply chains (Nakabayashi, 2013; Gosling *et al.*, 2015; Smyth and Duryan, 2020). The construction industry is knowledge-intensive, characterised by transient organisations, employee mobility, and KT losses

between organisations (Dang, Le-hoai and Kim, 2018; Zia, 2020). Nevertheless, there is limited research that has examined the effectiveness of KT from ISD initiatives and the subsequent operational performance of SME local contractors (hereafter just 'local contractors') in the construction industry.

The current study focuses on ISD initiatives delivered by the main contractor through the subcontracting of various works to local contractors (Kidalov, 2013). Other ISD initiatives are delivered through the direct participation of local contractors in Preferential or Reservation schemes (Marion, 2007). Additionally, some ISD initiatives take the form of training for local contractors in various construction techniques (Dapaah, Thwala and Musonda, 2016) or the provision of construction finance (GRZ, 2014; Construction Industry Development Board (CIDB), 2013).

For example, Zambia, a developing country in Southern Africa, has implemented a number of ISD initiatives for local contractors in the construction industry. The initiatives include Preferential and Reservation schemes (Ministry of Commerce Trade and Industry, 2018) and the 20 per cent subcontracting policy for road construction projects. This policy requires local contractors to undertake at least 20 per cent of all road contracts awarded by the central, quasi, and local government institutions as part of capacity building (Road Development Agency, 2016). Other initiatives involve training for local contractors, in various construction techniques, as run by the National Council for Construction (NCC) (National Council for Construction, 2017), and the Construction Finance Initiative that is meant to facilitate easy access to finance (GRZ, 2014; Road Development Agency, 2016). These SME oriented public procurement policies aim to stimulate KT to local contractors through ISD initiatives. The objective of ISD initiatives is to build the capacity of local contractors and help them break into the construction industry, which foreign companies have dominated for many years (GRZ, 2014; Cheelo and Liebenthal, 2018; Cheelo and Liebenthal, 2020). Despite the critical role that SME oriented public procurement policies play in public procurement, the effect of ISD initiatives on KT remains under-researched (Grandia and Meehan, 2017), particularly in the construction industry such as Zambia (GRZ, 2014).

Furthermore, supplier development activities can either be indirect or direct. However, there are some significant differences between the two approaches. Indirect supplier development is characterised by less commitment of buyer's resources to a particular supplier, including communication, buying organisational incentives for suppliers, competitive pressure, and promises of increased present and future business (Wagner, 2010; Krause, 2014). In contrast, direct supplier developments include close interactions, and relation-specific investments of human and capital resources to the supplier (Krause, 2014). The latter is also associated with KT activities such as

training, on-site consultations, buying organisation employee exchanges, and problem-solving (Modi and Mabert, 2007; Wagner, 2010; Krause, 2014). Arroyo-López, Holmen and de Boer (2012) argue that different categories of supplier development comprise a high level of involvement. However, only human and resource investment in the supplier organisation specifically involve KT.

In this research study, the ISD initiatives consist of indirect (Construction Finance Initiative, Preferential and Reservation schemes) and direct (the 20 per cent subcontracting policy and NCC training local contractors) supplier development. However, little is known about the implications of indirect and direct ISD initiatives on KT, in the construction industry in Zambia. It poses a challenge in knowing which ISD initiatives to prioritise with the limited resource envelope. Therefore, this study aims to establish which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT in the construction industry in Zambia. Secondly, to examine the effect of KT on the operational performance of local contractors in the construction industry in Zambia.

Furthermore, even though KT is critical in supplier development, studies indicate that the quality and degree of KT are mainly dependent on the willingness, and aptitude, of the recipient organisation, commonly referred to as its absorptive capacity (Liao, Fei and Chen, 2007; Arráiz, Henríquez and Stucchi, 2013; CIDB, 2013). Therefore, another area that is not clear from previous studies is the influence of absorptive capacity (AC) in the relationship between KT and the operational performance of local contractors. Todorova and Durisin (2007, p.774) define AC as the "ability of an organisation to acquire, assimilate, transform and exploit external knowledge." Although initially developed in the context of research and development (R&D) within the private sector, AC has the potential to help further understand how KT leads to performance improvement in supplier development, as recent studies have shown (Azadegan, 2011; Saenz, Revilla and Knoppen, 2013; Zhao, Zuo and Nancy, 2015). Research indicates that AC usually developed in the contexts of R&D, and supply chain collaborations have a positive impact on organisational performance outcomes (Cohen and Levinthal, 1990; Todorova and Durisin, 2007; Arroyo-López, Holmen and de Boer, 2012; Ebers and Maurer, 2014; Zhang and Lyles, 2018). Therefore, another significant objective of the study is to investigate the mediating role of AC in the relationship between KT and the operational performance of local contractors in the construction industry in Zambia.

Additionally, in the study of SME oriented public procurement policy from the developing country context, Patil (2017) argues that successful implementation of SME oriented procurement policies depends on the organisational factors and institutional environment around the programme. However, what is not clear is the extent to which institutional factors influence KT in ISD initiatives.

Research shows that buyer-supplier collaborations, such as ISD initiatives on their own, may not be sufficient to ensure success in KT (Squire, Cousins and Brown, 2009). It implies that other mechanisms are also crucial to the process.

For example, ISD outcomes are generally influenced by institutional factors because they are supported by SME oriented public procurement policy (Li *et al.*, 2016; Patil, 2017; Hawkins, Gravier and Randall, 2018). The influence of institutional factors within a buyer-supplier collaboration is well documented (Cai, Jun and Yang, 2010; Patil, 2017; Hawkins, Gravier and Randall, 2018). It is noteworthy to mention that every organisation is a subsystem of a broader social, cultural, economic, and political system that influences the survival and legitimacy of organisational practices (Glover *et al.*, 2014). Accordingly, it is argued in this research that institutional factors are part of the broader environment that shapes the development and implementation of the ISD initiatives.

The research contends that, if institutional factors are not consistent with ISD initiatives, they are likely to have a significant adverse effect on KT and, subsequently, operational performance improvement. Therefore, another important objective of the study, is to identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. Furthermore, the final objective is to investigate the moderating effect of institutional factors on the relationship between ISD initiatives and KT. The above arguments are conceptualised in Figure 1.1 below.

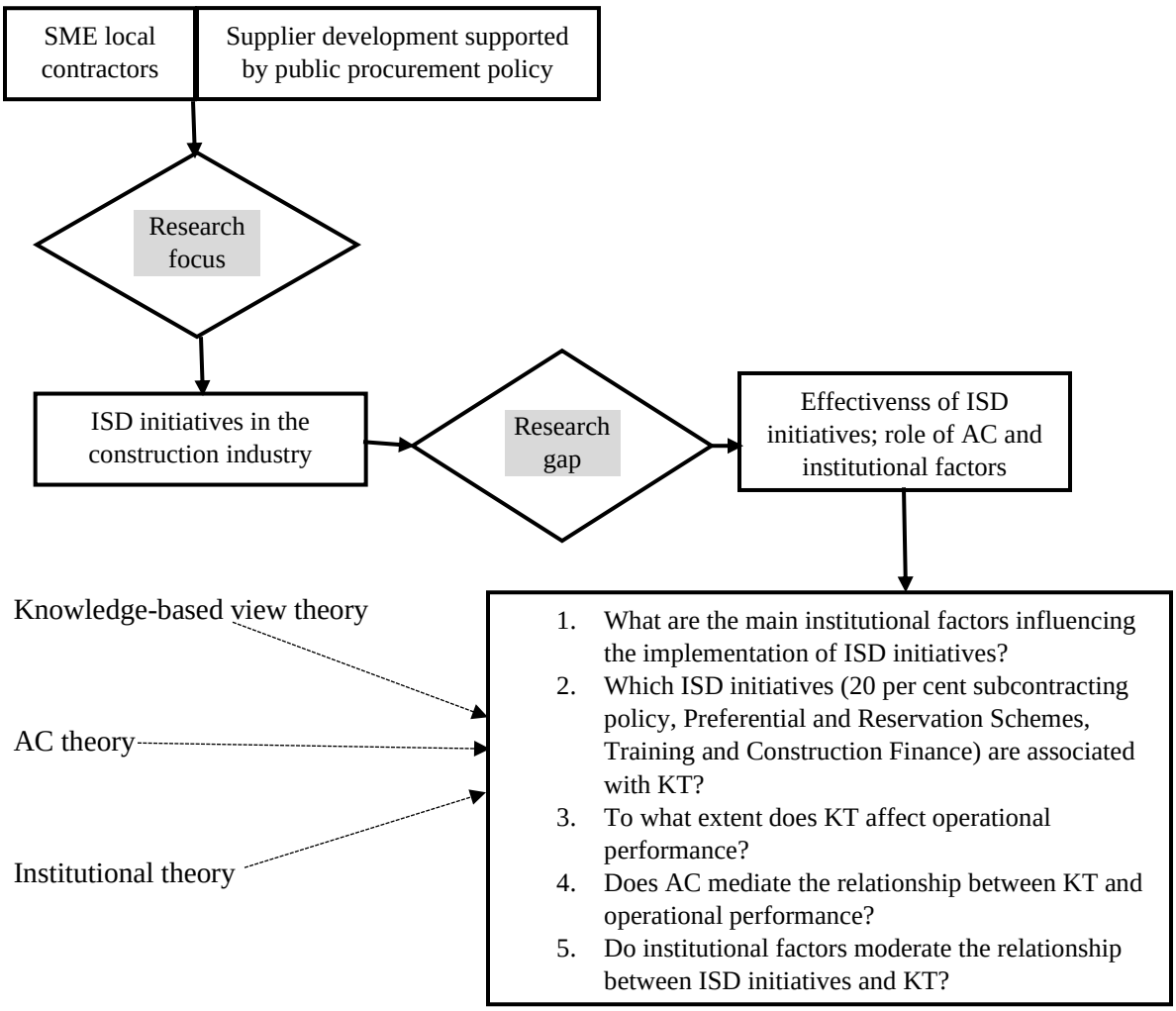


Figure 1.1 Conceptualisation of the study

1.2 Background to the study

1.2.1 SME oriented public procurement policies

Globally, the economic rationale for supporting SMEs, using public procurement policy, is well established and justified (Patil, 2017). Literature is replete with evidence of the critical role that SMEs play in an economy, such as job creation, poverty alleviation, and economic growth and sustainable development (Loecher, 2000; Loader, 2017). SMEs provide an innovative lever of the economy by exploring niche markets that are unattractive to large organisations (Singh, Garg and Deshmukh, 2008). For instance, literature is abounding about SME contribution to job creation in the manufacturing sector and GDP growth rates (Ayyagari, Beck and Demirguc-Kunt, 2007). SMEs have

been the driver of growth for the business sector and a driving force behind the rapid expansion of the commercial and social sectors through entrepreneurship (Ndiege, Herselman and Flowerday, 2012).

Loader (2017) argues that adopting SME oriented public procurement policies recognises the value that can be derived from SME participation in public procurement. It is, therefore, not surprising that SMEs have been the subject of increasing interest from both the academic and policy implementers in public procurement (Loader, 2015). Furthermore, Alkadry, Trammell and Dimand (2019) add that public procurement is a critical tool that enhances socio-economic development by supporting local procurement. Harland *et al.* (2019) add that the size of government procurement and its spending power can be used to develop SMEs through a variety of initiatives.

Furthermore, Loader (2017) reports that governments spend considerable resources in public procurement, which vary across jurisdictions. For example, Hawkins, Gravier and Randall (2018) indicate that the United States of America (USA) spend about $2.7 trillion annually in public sector procurement, and of this amount, about $90.7 billion in the fiscal year 2015 was spent in supporting SMEs. Similarly, Flynn (2018) adds that the United Kingdom (UK) spends about £240 billion, and the European Union (EU) spends about €1 900 billion in public procurement. In the same vein, OECD countries spend about 12 per cent, and Africa, about 20 per cent, of their GDP in public procurement (OECD, 2017; Asamoah, Annan and Rockson, 2019). The public procurement expenditure creates opportunities for SMEs in various sectors and can be leveraged as a tool for socio-economic development (Hawkins *et al.*, 2018). Loader and Norton (2015) add that public procurement has been an attractive market for SMEs because it provides reliable market opportunities. In sum, the massive expenditure by various jurisdictions, highlighted above, reflects the policy attention that SMEs receive from policymakers.

Patil (2017) notes that some jurisdictions have enacted specific legislative provisions, and SME oriented public procurement policies, to enhance the involvement of SMEs in public procurement. For example, SME access to public procurement can be promoted directly through ISD initiatives such as Reservation schemes (set-asides) and Preferential schemes. Others include subcontracting, training and easy access to finance, when supported by various pieces of public procurement legislation (Marion, 2007; Nakabayashi, 2013; Loader, 2017; Kidalov, 2013; Flynn, 2018). Similar ISD initiatives have been implemented in the public procurement of construction projects, using public procurement legislation and policies, in Japan (Nakabayashi, 2013) and Europe (Kidalov, 2013). However, Ibrahim *et al.* (2017) argue that merely enacting legislation to support

SME participation in public procurement does not guarantee compliance. Therefore, SME oriented public procurement policies have produced varied results.

In a 5-year comprehensive review of SME-oriented procurement policies in the UK, Loader (2017) found that the central government had a target of 25 per cent for SME participation in public procurement. However, institutions such as the National Health Services and local government provided better opportunities for SMEs, accounting for approximately 30 per cent and 49 per cent of SME commitment, respectively. Furthermore, in the study of Chilean ISD initiatives, Arráiz, Henríquez, and Stucchi (2013) assert that the programme stabilised the linkages between SMEs and their large buyer organisations. Furthermore, Hawkins, Gravier and Randall (2018) add that the USA federal government procurement objective stipulates that at least 23 per cent of all federal government contracts should be set aside for SMEs. The massive investment in SME programmes emphasises the critical role of public procurement as a tool for supporting SMEs and socio-economic development.

However, evidence from research over a decade shows little progress in improving SME access to public procurement contracts (Loader, 2017; Hawkins, Gravier and Randall, 2018). Some reasons have been advanced to explain the contributing factors to this challenge, such as organisational and institutional factors. In the study of compliance levels with respect to procurement laws and policies for enhancing SME participation in Ghana, Ibrahim *et al.* (2017) found that compliance to procurement laws was ineffective and mostly a façade. This argument is resounded by other researchers who have found that despite significant investment in SME oriented public procurement policies, there have been mixed results, with most implementers failing to achieve the set goals (Patil, 2017; Oluka, Okoche and Mugurusi, 2020). In addition, Hawkins, Gravier and Randall (2018) cite bottlenecks to SME participation in public procurement such as contract bundling, supplier rationalisation and a lack of accountability for achieving socio-economic objectives. Furthermore, the rigidity of public procurement laws is also impeding the successful actualisation of SME oriented procurement policies. In the study of SME oriented procurement policy in India, Patil (2017) acknowledges that the conformance-performance tension in various public procurement policy objectives makes the implementation of SME public procurement policies difficult.

Additionally, using Australia as an example, Glover (2008) argues that, despite the increase in the average number of public procurement contracts won by SMEs, procuring agencies have not met the minimum criteria for SMEs to compete in large contracts. For instance, in their review of the preferential procurement in South Africa, Taylor and Raga (2012) argue that the preferential considerations in tender documents are highly subjective. Hence the initiative has not adequately

addressed the economic gap between historically disadvantaged persons. Furthermore, Oluka, Okoche and Mugurusi (2020) deplore the fact that there is less emphasis on the dual role of public procurement in the acquisition of goods and services, and the promotion of disadvantaged enterprises, in public procurement. However, Loader and Norton (2015) suggest that the importance and types of challenges faced by SMEs in participating in public procurement may vary by sector, requiring more targeted support and distinct, sector-driven solutions.

Despite these challenges, SME access to public procurement is a prominent subject to governments (Hawkins *et al.*, 2018). Research on SME oriented public procurement policies is increasingly becoming popular in contemporary literature. For example, targeted SME strategies have been established in different jurisdictions, such as training, improving access to information and enhanced monitoring mechanisms, when implementing SME oriented public procurement policies (Loader, 2017; Cravero, 2018). Furthermore, some SME oriented public procurement policies have yielded positive results, especially in developed countries with well-established regulatory regimes, for engaging SMEs in public procurement (Arráiz, Henríquez and Stucchi, 2013; Patil, 2017). These arguments raise relevant concerns about emulating such policies in developing countries, which suffer from weak procurement regulatory regimes. Therefore, this research contributes to the debate on SME oriented public procurement policies by focusing on ISD initiatives for local contractors in the construction industry in Zambia.

1.2.2 SME broad-based policies in Zambia

Zambia, like many developing countries, has made SMEs the driving force of the economy. Developing business with government agencies, by accessing public procurement contracts, is one way of ensuring a market for SME local suppliers, thereby fulfilling one of the government's broad objectives of job creation. This is also espoused in the 7th National Development Plan (7NDP) 2017-2021 of Zambia, emphasising inclusive socio-economic development (7NDP, 2017). The 7NDP is a multi-sectoral national development plan aiming to create a diversified and resilient Zambian economy, for sustainable socio-economic growth towards a middle-income country, by 2030. One of the objectives of the 7NDP, concerning SME development, is to address constraints to SME growth through the policy and regulatory environment. The government intends to enhance the public sector's procurement capacity to support the growth and development of the private sector. The government plans to prioritise the participation of the private sector in implementing the SME participation strategy by enhancing public-private dialogue and partnerships (7NDP, 2017). Furthermore, the 7NDP has also prioritised an ambitious infrastructure development agenda that includes an accelerated national roads construction programme and new districts (Cheelo and

Liebenthal, 2020). Part of the objective of infrastructure development is to develop a sustainable construction capacity for local contractors through skills and technology transfer (Cheelo and Liebenthal, 2020).

The 7NDP is premised on the UN 2030 sustainable development goals (SDGs), particularly the SDG numbers 1, 8, and 9, which focus on poverty alleviation through sustainable economic development, industrialisation, and the promotion of innovation (UNDP, 2017). These broad-based multi-sectoral policies support a coordinated approach to inclusive and sustainable development through active participation of the private sector in economic activities. Interactions between major players in the private sector, government, and SMEs are critical to achieving the broad-based objectives outlined above. The relationships between the private sector, government and SMEs are mainly affected by the market's regulatory environment and government policies, that either promote or impede business growth (Arráiz, Henríquez and Stucchi, 2013). However, the willingness of SMEs and their AC to exploit government value-creation policies to compete favourably with international actors, is equally crucial in shaping such relations (Arráiz, Henríquez and Stucchi, 2013; 7NDP, 2017).

One way to ensure the continuous growth of local SME capacity is through supplier development programmes, in particular through ISD initiatives, by leveraging SME-oriented public procurement policies, as studies have shown (Patil, 2017; Hawkins, Gravier and Randall, 2018; Oluka, Okoche and Mugurusi, 2020). Supplier development is a bilateral mechanism used by the purchasing organisation to improve the performance and capabilities of their suppliers (McKevitt and Davis, 2014; Sancha *et al.*, 2015; Glock, Grosse and Ries, 2017; Chen, Ellis and Holsapple, 2018).

Furthermore, as discussed earlier, there are two types of supplier development initiatives: indirect and direct. Indirect supplier development has little involvement with the buying organisation. On the contrary, direct supplier development encompasses a high level of involvement by the buying organisation (Wagner, 2010; Arroyo-López, Holmen and de Boer, 2012; Krause, 2014). The current research study considers both indirect (Construction Finance Initiative, Preferential and Reservation schemes) and direct (20 per cent subcontracting policy and NCC training of local contractors) ISD initiatives in the context of the construction industry in Zambia, in order to examine the implications of both indirect and direct ISD initiatives on KT.

1.2.3 ISD initiatives in the construction industry in Zambia

ISD initiatives in the Zambian context refer to deliberate government policies to support local suppliers' participation in economic activities. One such category is through the Citizens Economic

Empowerment Commission (CEEC) Preferential and Reservation schemes (Ministry of Commerce Trade and Industry, 2018). CEEC Preferential and Reservation schemes support targeted citizen-owned enterprises to help them contribute to economic activities (Ministry of Commerce Trade and Industry, 2018). The other type of ISD initiative focuses on both public and private suppliers, through the NCC's training of local contractors. NCC is a statutory organisation responsible for regulating the construction industry and building the capacity of local contractors through training (National Council for Construction, 2017). Additionally, the Road Development Agency (RDA) implemented the 20 per cent subcontracting policy for road construction projects in 2013. This followed the government's introduction of a policy that local contractors should execute at least 20 per cent of all road contracts awarded by central, quasi-autonomous institutions, and local governments as part of capacity building (Road Development Agency, 2016).

Furthermore, the Construction Finance Initiative is another vital ISD initiative in the construction industry, which aims to develop supplier capacity by offering easy access to finance without collateral requirements (Road Development Agency, 2016). Through SME-oriented public procurement policy, these government-supported initiatives are expected to encourage local contractors to break into the construction industry in Zambia (GRZ, 2014; Cheelo and Liebenthal, 2018). The construction industry market has, for many years, been dominated by foreign companies (accounting for over 70 per cent of market share) because they have demonstrated both financial capacity, and human capability, as demonstrated in Figure 1.2 (GRZ, 2014; National Council for Construction, 2017; Cheelo and Liebenthal, 2020). Figure 1.2 summarises information on the grading of construction companies, by number and ownership.

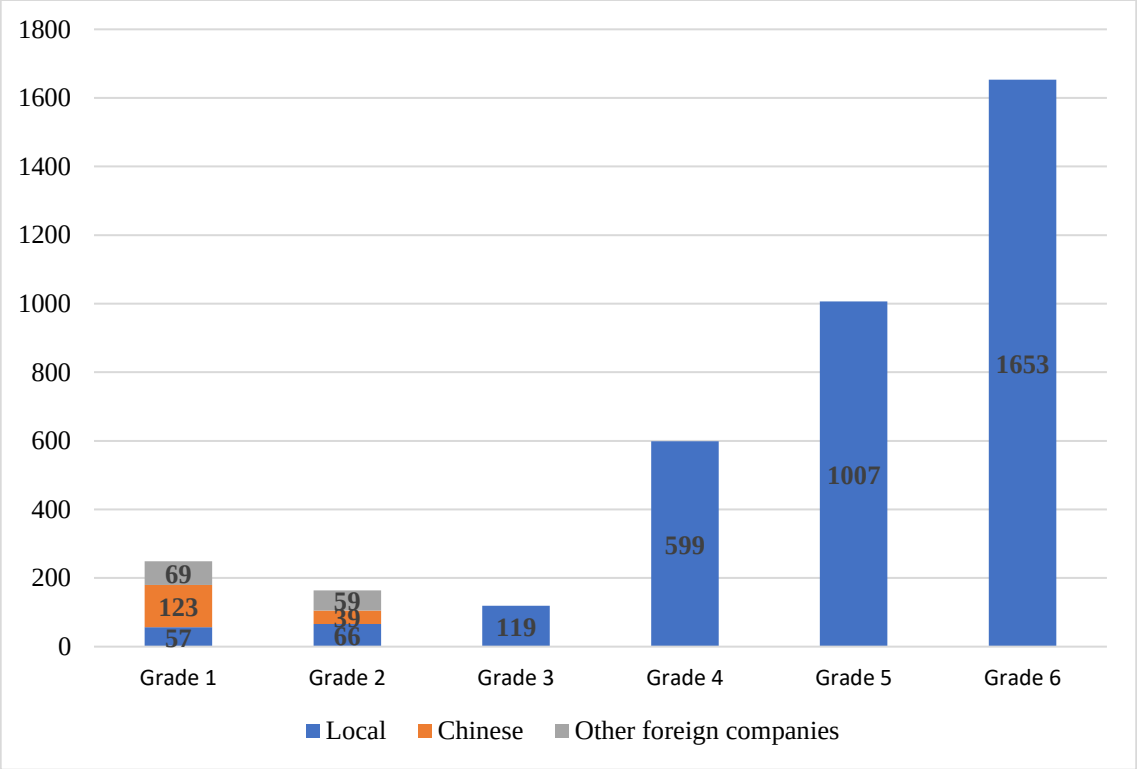


Figure 1.2 Grading of construction companies, by number and ownership

Source: Cheelo and Liebenthal (2020, p. 405)

The NCC registers and grades contractors on a six-tier grading system where grade 1 is the highest, comprising contractors who can execute the maximum contract value, and grade 6 is the entry point. Figure 1.2 shows that the local construction industry's foreign companies, which represent over 70 per cent of the market share, only comprise about 7 per cent of the construction companies. Meanwhile, local contractors, who represent over 90 per cent of the contractors, only occupy less than 30 per cent of the market share. These disparities have resulted in heightened calls for examining the efficacy of ISD initiatives in the construction industry, as a tool for stimulating local contractor capacity development.

The construction industry is very critical to the economy of Zambia. Currently, the construction industry contributes approximately 9.3 per cent of the GDP, with an average employment rate of 3.8 per cent of the workforce (7NDP, 2017; Cheelo and Liebenthal, 2020). For example, in terms of budget allocation, about K8.6 billion Kwacha (about $500 million) of the 2018 budget, representing 12 per cent of the total budget, was allocated to infrastructure development (GRZ, 2018). In 2019, a total of K8.7 billion Kwacha, representing 10 per cent of the total budget, was allocated to infrastructure development (KPMG, 2019). The various infrastructure projects

currently being implemented have a combined budget of approximately $8 billion (GRZ, 2014; Road Development Agency, 2016; Cheelo and Liebenthal, 2020), and are very strategic to the government of the Republic of Zambia. One of the main objectives of these projects is to ensure capacity building of local contractors, through KT from ISD initiatives such as Preferential and Reservation schemes, the 20 per cent subcontracting policy, NCC training, and Construction Finance Initiative.

However, a parliamentary report on local contractors' participation in the construction industry in Zambia revealed that one of the significant challenges, affecting policy intervention in ISD initiatives, is a lack of research into the status of local contractor participation in the industry (GRZ, 2014). Furthermore, Cheelo and Liebenthal (2020) call on the policymakers to pay particular attention to the efficiency of the massive investment in infrastructure development. Nevertheless, their study focuses primarily on financial performance indicators such as the incremental capital-output ratios (investment as a percentage of GDP) instead of KT of participants such as local contractors.

At present, it is therefore difficult to establish the efficacy of ISD initiatives in terms of KT and subsequently how to prioritise them, amidst limited competing public resources, in the absence of empirical evidence. KT is an essential aspect of supplier development, which improves supplier operational performance and capability (Chen, Ellis and Holsapple, 2018).

Furthermore, Chen, Ellis and Holsapple (2015) argue that supplier development is premised on knowledge management activities, even though there are sparse empirical studies from the knowledge management perspective. Therefore, this research partly contributes to the knowledge management perspective of supplier development, by establishing which ISD initiatives are associated with KT and the effect of KT on the operational performance of local contractors in the construction industry in Zambia.

1.2.4 ISD initiatives and KT

Chen, Ellis and Holsapple (2015) conducted an extensive systematic review of supplier development classification and found that most supplier development activities were predicated on knowledge management. Supplier development activities, such as training and close interactions, encompass KT from the buying organisation to the supplier (Wagner, 2010). Equally, Chen, Ellis and Holsapple (2018) add that supplier development increases the stock of new knowledge in the suppliers' repository, ultimately improving its performance and capability. In sum, studies recognise the importance of knowledge as a strategic resource (Grant, 1996), and highlight the role of supplier development in facilitating KT through buyer and supplier interactions (Wagner, 2010).

Similarly, some ISD initiatives are associated with KT and performance improvement. For example, Arráiz, Henríquez, and Stucchi (2013) conducted a study to evaluate the Chilean supplier development programme between SME local suppliers and large exporting organisations. The supplier development programme involved incentives for large organisations through subsidies to provide training, information advice, employee exchanges, technical assistant, and technology transfer to SME suppliers at a low cost. The study found that both SME local suppliers and large exporting organisations benefited from government coordination efforts through increased sales, employment, and the sustainability of SME suppliers. Similarly, Macedonia implemented a supplier development programme to stimulate linkages between local SMEs and large foreign companies, through the provision of information, skills, and technical capacity, to meet the needs of investors (Metz *et al.*, 2017). The programme supported SMEs to win more and higher value contracts.

Furthermore, Arroyo-López, Holmen and de Boer (2012) investigated the effect of supplier development on supplier performance beyond the usual dyad level of buyer-supplier in Mexico. The study included the role of government in facilitating the interaction between the supplier and buyer. Mexican government agencies and cooperating partners sponsored the programme to integrate local suppliers into the supply chain. The study found that the programme led to an improvement in the performance of suppliers with sufficient AC. The programme also improved the collaborative and relational learning context for local suppliers.

Comparable programmes have been implemented in South Africa through the Preferential Procurement Policy Framework Act No. 5 of 2000 (Taylor and Raga, 2012; Patil, 2017) and the Construction Industry Development Board in the construction industry (CIDB, 2013). The CIDB (2013) argues that the relationship between the main contractor and the subcontractor has a high potential for skills and KT. However, the degree of KT is mainly dependent on the AC of the subcontractor and incentives for the client to foster KT. Related studies involving ISD initiatives, albeit with mixed results, have been implemented in Tanzania, Lesotho and Malawi (Dapaah, Thwala and Musonda, 2016).

However, even though these studies have reported varied results, there is limited knowledge about the effect of ISD initiatives on KT, particularly in the construction industry. The studies have not delineated, for example, which ISD initiatives, indirect or direct, are more effective in stimulating KT in the construction industry. Therefore, this research study fills this gap in public procurement policy, particularly in the construction industry.

1.2.5 AC and KT in ISD initiatives

AC is a fundamental learning process used by an organisation to acquire, assimilate, transform and exploit knowledge for performance improvement (Zahra and George, 2002; Lane, Koka and Pathak, 2006; Todorova and Durisin, 2007; Zhang, Zhao and Lyles, 2018). In order to advance the research agenda, the study is anchored in knowledge-based theory to understand how KT, from ISD initiatives, affect the operational performance of local contractors through AC. Grant (1996) contends that an organisation is a repository of knowledge and its principal functions are to coordinate, integrate, and combine various forms of critical knowledge for competitive performance. For local contractors to recognise and acquire valuable knowledge, they must have sufficient AC (Arroyo-López, Holmen and de Boer, 2012). Therefore, for local contractors, this entails navigating the challenges associated with resources, and other operating constraints which characterise SMEs.

Flatten, Greve and Brettel (2011) argue that there is a dearth of research on AC in the context of SMEs because most of it focuses on established large organisations. SMEs have some key strengths, but also several significant weaknesses. Unlike SMEs, large organisations with significant prior relevant knowledge and resource bases can easily acquire, assimilate, transform and exploit knowledge more efficiently through investments in R&D than SMEs (Ndiege, Herselman and Flowerday, 2012). On the other hand, SMEs usually lack sufficient resources to invest in the generation of internal knowledge and are characterised by significant KT losses. Furthermore, Zia (2020) acknowledges that SMEs in project-based organisations are less advanced in knowledge management activities because of underdeveloped knowledge management processes and systems.

However, questions about the effect of AC on the performance of SMEs that are based on their strengths, such as simple organisational structures, limited employees and flexibility that enables them to be responsive to market needs, remain unanswered (Flatten, Greve and Brettel, 2011; Wuryaningrat, 2017). Furthermore, particularly in the current research, local contractors provide a unique, but unequivocally exciting context for understanding the influence of AC on the relationship between KT and operational performance when considered against their smallness liabilities (Zia, 2020). Local contractors operate in a knowledge-intensive construction industry which is characterised by temporary organisations and KT losses between, and among, organisations (Smyth and Duryan, 2020). However, despite the preceding notable challenges, Ndiege, Herselman and Flowerday (2012) assert that AC is an essential lever in the organisation's learning process, regardless of size, and a strong predictor of organisational performance. Therefore, understanding the influence of AC on the relationship between KT and the operational performance of local contractors could

provide essential insights into the under-researched area of ISD initiatives in the construction industry.

Furthermore, previous research studies also argue that the AC of the organisation has a significant impact on knowledge sharing and the ability to innovate (Wuryaningrat, 2017). For example, Liao, Fei and Chen (2007) argue that knowledge sharing has a positive impact on AC and subsequently on organisation innovation in their study of Taiwanese electronic, financial and medical industries. Wuryaningrat (2017) conducted a similar study on the mediating effect of AC on the relationship between knowledge sharing and innovation capability of SMEs in Indonesia and found that KT has a positive impact on AC, which subsequently leads to improved innovation capability of the organisation. Similarly, in their study of project-based organisations in Pakistan, Ali, Musawir and Ali (2018) found that knowledge-sharing improves the AC of project teams, leading to project performance improvement.

Correspondingly, in their study of organisational compatibility and performance in the buyer-supplier relationship, Saenz, Revilla and Knoppen (2013) reiterate that supply chain partners need to leverage AC in the buyer-supplier relationship to deliver superior value to customers. Additionally, Zhang, Zhao and Lyles (2018) found that trust and information systems significantly affect product innovation, and AC fully mediated the relationships. Finally, using panel data from high-tech manufacturing organisations in China, Duan, Wang and Zhou (2020) also found that AC significantly mediated the relationship between organisational slack and innovation performance.

Despite previous findings on AC and performance improvements, the majority of studies have, to date, analysed AC from the perspective of large corporations using measurement proxies such as R&D expenditure or the number of patents (Duan *et al.*, 2020). These measures are unlikely to fully reflect the multidimensional complexities of AC (Ebers and Maurer, 2014; Manley, Rose and Lewis, 2014). Furthermore, these proxies provide less accurate representations of the AC concept and raise concerns about the internal and external validity of the construct (Lane, Koka and Pathak, 2006; Ebers and Maurer, 2014). Other studies define AC from the narrow perspective of motivation and the ability of employees to gain external knowledge, and the willingness to use this knowledge for innovation purposes (Liao, Fei and Chen, 2007; Wuryaningrat, 2017). Previous research also focuses on innovation-related performance only in the private sector context (Duan *et al.*, 2020), so there is a paucity of research into public-funded construction projects.

Furthermore, there is less clarity as to how the AC may influence the relationship between KT from ISD initiatives and the operational performance of local contractors. Additionally, there is also a need to understand the influence of AC as a multidimensional construct consisting of

knowledge acquisition, assimilation, transformation, and application (Tessa Christina Flatten et al., 2011) instead of widely used proxy measurements. Moreover, there is limited knowledge of how the AC dimensions individually, and jointly, influence performance outcomes (Ebers and Maurer, 2014; Lawrence, Chan, and James, 2016), particularly for local contractors in the construction industry. The construction industry is characterised by unique challenges faced by transient organisations, such as weak AC and KT losses between and among organisations (Manley, Rose and Lewis, 2014; Dang, Le-hoai and Kim, 2018; Smyth and Duryan, 2020). These gaps have received relatively little attention in the existing literature and merit further consideration in the current study.

1.2.6 Institutional factors and KT in ISD initiatives

Institutions are the subject of research in various fields such as economics, political and organisational studies, with calls for similar studies into operations and supply chain management (Kauppi, 2013). Scott (1995, 2014) characterises institutions as consisting of regulative, normative, and cognitive dimensions that provide stability and meaning to social behaviour. For example, the regulative dimension of the institution consists of laws, regulations and government policies that promote or constrain certain behaviours (Dharam and Singh, 2015). Loader (2017) argues that the regulatory framework for implementing SME oriented public procurement policies requires a consideration of various issues such as compliance, discretion, enforcement and sanctions. Patil (2017) adds that the implementation of SME oriented public procurement policies needs an understanding of the interplay among different factors such as legislation, technocrats, and political players. In the study of the Zambian construction industry, Cheelo and Liebenthal (2020) argue that ISD initiatives are largely driven by political and economic factors, which should be considered to understand the performance of the construction industry.

In the current research study, the legislation governing the implementation of ISD initiatives include the CEEC Act No. 9 of 2006 on Preferential and Reservation schemes (Ministry of Commerce Trade and Industry, 2018), the NCC Act No. 13 of 2003 on NCC training in the construction industry (National Council for Construction, 2017), and the 20 per cent subcontracting policy and Construction Finance Initiative (Road Development Agency, 2016). The normative dimension consists of moral obligations in the business environment. The normative element sets out the objectives and rules for achieving KT and empowerment in ISD initiatives in the current study. The cognitive dimension reflects the cultural elements shared by people in a given location. In the Zambian context, it is essential to pay attention to institutional factors in implementing ISD initiatives in the construction industry, because infrastructure development is mainly driven by political and economic factors (Cheelo and Liebenthal, 2020).

Institutional factors are part of the broader environment that shapes the development and implementation of different public policy initiatives (Patil, 2017; Loader, 2017). For instance, van Bueren and Priemus (2002) cite institutional factors as the main barriers to implementing sustainable construction initiatives in the Netherlands. Furthermore, van Bueren and Priemus (2002) argue that it is not technical, but institutional factors that underlie the fact that sustainable construction has not yet been able to breakthrough in the Netherlands. A relevant consideration in the current research is, to identify which institutional factors, influence the implementation of ISD initiatives in the construction industry and investigate their moderating effect on the relationship between ISD initiatives and KT.

1.3 Rationale of the study and problem statement

After extensively auditing the literature, some gaps have been identified in the Zambian context, particularly in the construction industry, and this research anticipates addressing such. There is sparse evidence to ascertain which ISD initiatives are associated with KT in the construction industry, such as Zambia. As revealed earlier, existing literature indicates that indirect and direct supplier development approaches have different implications on KT (Modi and Mabert, 2007; Wagner, 2010; Arroyo-López, Holmen and de Boer, 2012; Krause, 2014; Smyth and Duryan, 2020). However, empirical evidence is still lacking in the construction industry. For example, a report on the participation of local contractors in ISD initiatives, from the Zambia National Assembly Committee responsible for Works, Transport, Communication and Supply, found that the lack of empirical research in the construction industry was a significant challenge in the development of policy interventions in the industry (GRZ, 2014). The public procurement policies in the construction industry in Zambia support both indirect (Construction Finance Initiative, Preferential and Reservation schemes) and direct (the 20 per cent subcontracting policy and NCC training) ISD initiatives. However, little is known about the KT implications of indirect and direct ISD initiatives. The paucity of research poses a challenge to know which ISD initiatives to prioritise with the limited public procurement resource purse. Therefore, the first part of this work seeks to establish which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT.

Secondly, supplier development as a company strategy has earned success, to some degree, in private companies through KT (Marksberry, 2012; Chen, Ellis and Holsapple, 2015; Chen, Ellis and Holsapple, 2018), with similar calls for this strategy to be extended to public procurement. In response to these calls, an argument, that examines the effectiveness of KT in public-funded construction projects (Gosling *et al*., 2015), is necessary (McKevitt and Davis, 2014; Grandia and

Meehan, 2017). The critical role of supplier development in the private sector can be extended to the public procurement sector, accounting for approximately 12 to 20 per cent of the global GDP (OECD, 2017; Asamoah, Annan and Rockson, 2019).

The construction industry is very critical to the Zambian economy. The various infrastructure projects currently being implemented have a combined budget of approximately $8 billion (GRZ, 2014; Road Development Agency, 2016; National Council for Construction, 2017). One of the main objectives of the massive infrastructure development is to develop a sustainable local construction capacity by encouraging KT through ISD initiatives. Despite massive investment in infrastructure and local contractors, SMEs comprise over 90 per cent of local contractors in the construction industry, with a market share of less than 7 per cent (Cheelo and Liebenthal, 2020). Contractor registration patterns can corroborate findings in the past three years (Cheelo and Liebenthal, 2018), which attest to a lack of improvement by local contractors. At present, it is a challenge to establish the efficacy of ISD initiatives, in terms of KT and the subsequent impact on the operational performance of local contractors in Zambia. Therefore, examining the effectiveness of KT in ISD initiatives is envisaged to inform future policy in the construction industry in Zambia and similar contexts. Consequently, the second part of the research seeks to examine the effect of KT on the operational performance of local contractors in the construction industry in Zambia.

Thirdly, this research extends the concept of AC by examining the mediating influence of AC on the relationship between KT and operational improvement. The study focuses on the construction industry with its weak AC and KT levels, owing to the transient nature of organisations, and which consequently results in knowledge discontinuities between and among organisations (Manley, Rose and Lewis, 2014; Lawrence, Chan, and James, 2016; Dang, Le-hoai and Kim, 2018; Smyth and Duryan, 2020). Furthermore, the study applies a multidimensional construct of AC, namely knowledge acquisition, assimilation, transformation and application (Tessa Christina Flatten *et al.*, 2011), in contrast to widely used proxy measurements such as investment in R&D, the number of patents and technicians (Duan *et al.*, 2020). Additionally, there is limited knowledge of how the dimensions of AC individually and jointly mediate the relationship between KT and the operational performance of local contractors in the construction industry. These gaps have received relatively little attention, as has been demonstrated in existing literature, despite acknowledging that the quality and degree of KT are mainly dependent on the AC of the subcontractor in the subcontracting arrangement (CIDB, 2013). Understanding the mediating influence of AC on the relationship between KT and local contractors' operational performance will be vital in guiding policy makers on how to engage local contractors in ISD initiatives in the construction industry in Zambia and similar

contexts. Therefore, this research investigates the mediating role of AC on the relationship between KT and operational improvement.

Fourthly, the success of the implementation of SME-oriented procurement policies depends on both the organisational and institutional environment around the programme (Patil, 2017). Previous studies have contributed to understanding ISD initiatives using public procurement policies (Arroyo-López, Holmen and de Boer, 2012; Arráiz, Henríquez and Stucchi, 2013; Patil, 2017; Hawkins, Gravier and Randall, 2018). However, the role of institutional factors on the implementation of ISD initiatives and KT has neither been tested satisfactorily nor described empirically. Institutional factors, such as the regulatory compliance and government support in which ISD initiatives are implemented, play a critical role (Cai, Jun and Yang, 2010; Kidalov, 2013; Patil, 2017) and deserve consideration. Institutional factors are part of the broader business environment that shapes the development and implementation of various public initiatives. For example, van Bueren and Priemus (2002) cite institutional factors as the main barrier to implementing sustainable construction initiatives in the Netherlands. Therefore, the study would like to first identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia and then investigate the moderating role of institutional factors on the relationship between ISD initiatives and KT.

Given the gaps identified in existing literature, questions about which ISD initiatives are associated with KT, and the effect of KT on the operational performance of local contractors, remain unanswered. Furthermore, the mediating role of AC on the relationship between KT and operational performance, and the moderating role of institutional factors on the relationship between ISD initiatives and KT, remain unanswered. Therefore, this research work aspires to address the above-highlighted gaps, particularly in the under-researched context of Zambia's construction industry.

1.4 Purpose of the study

The purpose of the study is to examine the effect of knowledge transfer from institutionalised supplier development initiatives on the operational performance of local contractors. Furthermore, the study investigates the mediating role of AC on the relationship between KT and operational performance, and the moderating effect of institutional factors on the relationship between ISD initiatives and KT. The specific objectives of the research study are as follows:

1.4.1 Research objectives

1. To identify the main institutional factors influencing the implementation of ISD initiatives.
2. To establish which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT.
3. To examine the effect of KT on operational performance.
4. To investigate the mediating role of AC on the relationship between KT and operational performance.
5. To investigate the moderating role of institutional factors on the relationship between ISD initiatives and KT.

1.4.2 Research questions

1. What are the main institutional factors influencing the implementation of ISD initiatives?
2. Which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT?
3. To what extent does KT affect operational performance?
4. Does AC mediate the relationship between KT and operational performance?
5. Do institutional factors moderate the relationship between ISD initiatives and KT?

1.5 Proposed conceptual framework and hypotheses

The following conceptual framework and hypotheses were developed after reviewing the extant literature on supplier development, ISD initiatives and KT in supplier development. Furthermore, the literature also covered AC, institutional factors, specifically regulatory compliance, government support, and operational performance. The proposed conceptual framework provides a pictorial representation of how the five ISD initiatives, AC and institutional factors are linked to KT and operational performance. Furthermore, the hypotheses presented below will be statistically tested in Chapter 7 to determine the significance of the relationships among variables.

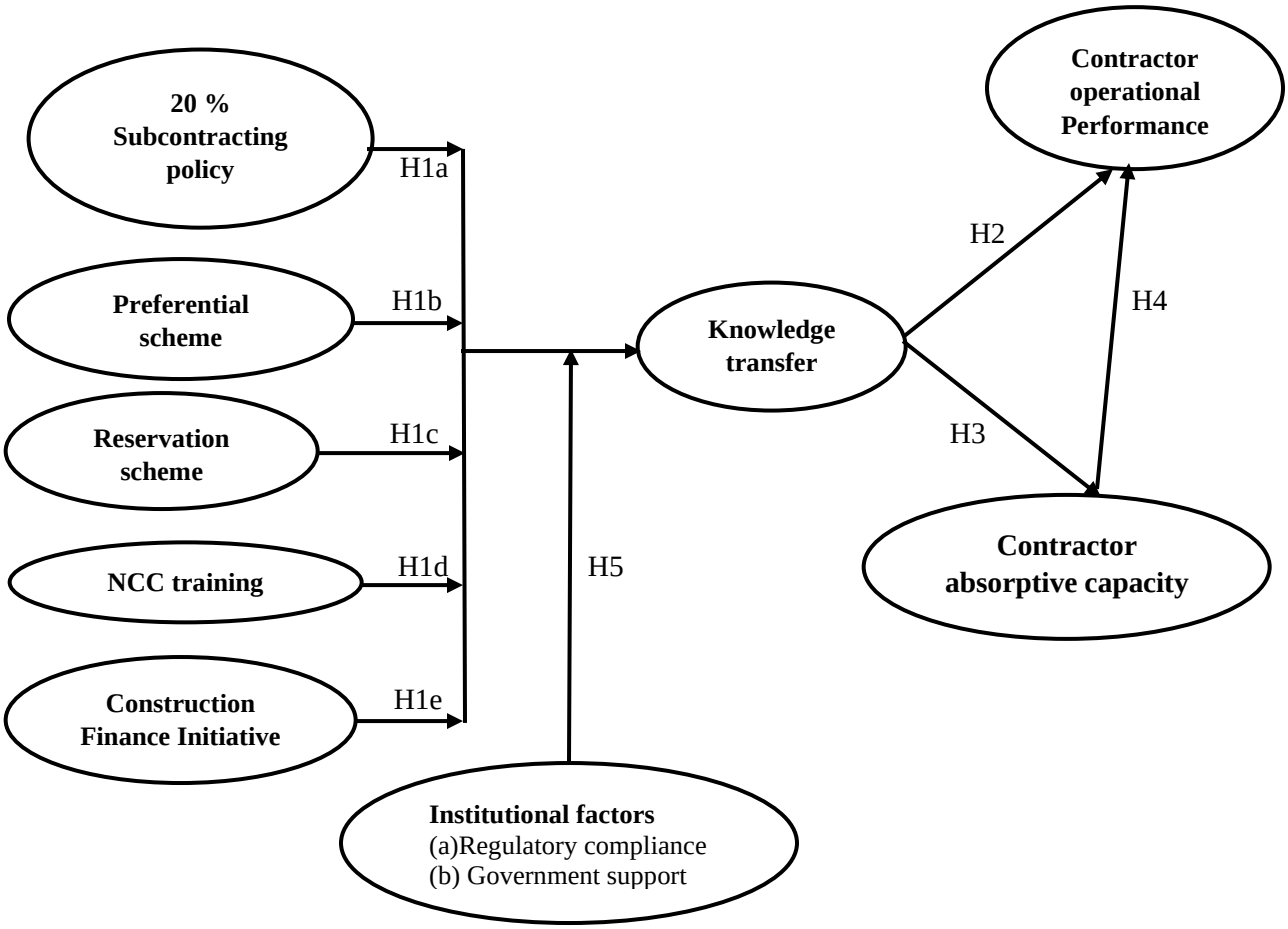


Figure 1:3 Conceptual framework

Source: Researcher (2019)

1.5.1 Hypotheses

1. **H1a:** ISD (20 per cent subcontracting policy) is positively associated with KT.
2. **H2b:** ISD (Preferential scheme) is positively associated with KT.
3. **H3c:** ISD (Reservation scheme) is positively associated with KT.
4. **H4d:** ISD (NCC training programme) is positively associated with KT.
5. **H5e:** ISD (Construction Finance Initiative) is positively associated with KT.
6. **H2:** KT has a positive influence on the operational performance of local contractors.
7. **H3:** KT has a positive influence on the AC of local contractors.
8. **H4**: AC has a positive influence on the operational performance of local contractors.
9. **H5a**: Regulatory compliance moderates the relationship between ISD initiatives and KT.
10. **H5b**: Government support moderates the relationship between ISD initiatives and KT.
11. **H6**: AC mediates the relationship between KT and the operational performance.

1.6 Research justification

The research investigates the efficacy of KT in ISD initiatives implemented, in the context of SME oriented public procurement policies. Despite these political initiatives being popular from the socio-economic perspectives of government, the field is still in its infancy in terms of academic research inquiry. Limited studies that have addressed the ISD initiatives have been from a policy review perspective (Loader, 2017; Flynn, 2018; Cheelo and Liebenthal, 2020). There is consensus among stakeholders in the construction industry, which is mainly public sector driven, that local contractors should be a high priority on the Zambian policy agenda in order to develop a sustainable local construction capacity. However, there is still a lack of empirical evidence on the impact of ISD initiatives on local contractors' KT and performance improvement. The absence of research has constrained policy interventions in the construction industry, as has been revealed by the Zambian Parliamentary Committee on Communications, Transport, Works, and Supply (GRZ, 2014) and echoed by Cheelo and Liebenthal (2018, 2020).

Furthermore, despite the private sector receiving significant research attention, there is limited research into ISD initiatives, particularly for public-funded construction projects. Therefore, the current research is one of the early empirical studies to investigate the efficacy of KT resulting from ISD initiatives in the construction industry. The research study focuses on SME local contractors who participated in ISD initiatives from 2017 to 2019.

1.7 Research study contribution

The findings from this research study make theoretical and practical contributions to the current literature on supplier development and ISD.

Firstly, the study has qualitatively outlined the main institutional factors influencing the implementation of ISD initiatives, in the construction industry, as a basis for designing effective initiatives. The research supplements existing literature which partly argues that in order to implement SME oriented public procurement policies effectively, there is a need to address institutional factors that influence ISD initiatives (Patil, 2017; Grandia and Meehan, 2017; Hawkins, Gravier and Randall, 2018). In the current study, institutional factors broadly fall into regulatory compliance and government support. Regulatory compliance encompasses political influence, corruption and unfair competition, the robustness of the regulatory system, fronting and the criteria required for participating in ISD initiatives. Furthermore, government support includes information dissemination, training, financing, monitoring and evaluation systems for ISD initiatives.

Secondly, existing literature suggests that direct supplier development activities involving high interaction are associated with KT (Modi and Mabert, 2007; Wagner, 2010; Arroyo-López, Holmen and de Boer, 2012; Grandinetti, 2016; Smyth and Duryan, 2020). This research advances the current knowledge using the knowledge-based view theory, by extending the findings from the private sector context to public procurement using ISD initiatives in the construction industry. The study has empirically demonstrated that only the 20 per cent subcontracting policy and NCC training are significantly associated with KT. The findings provide a basis on which to prioritise the implementation and funding of ISD initiatives because the government and other public institutions are continually operating on a limited public procurement budget. Priority needs to be given to the 20 per cent subcontracting policy and NCC training as the main ISD initiatives that stimulate KT. These revelations are critical in guiding the design and implementation of ISD initiatives in the construction industry by the government and its quasi-institutions.

Thirdly, using the AC theory, the research clarifies limited knowledge of how the AC dimensions individually, and jointly, influence the relationship between KT and operational performance improvement (Ebers and Maurer, 2014; Lawrence, Chan, and James, 2016). Another significant finding is that, overall, AC influences the relationship between KT and operational performance more than its dimensions (Arroyo-López, Holmen and de Boer, 2012; Ebers and Maurer, 2014). The research contributes to the AC theory by demonstrating that the effect of KT on operational performance diminishes when AC is introduced in the conceptual framework. The findings reveal that KT alone is not sufficient to improve the operational performance of local contractors in the construction industry. The finding is also echoed by Ali, Musawir and Ali (2018), in a project-based organisation setting, who argues that knowledge sharing does not directly impact performance, but rather improves AC, leading to performance improvement. The research proposes that contractor participation in ISD initiatives should be based on their AC levels.

Fourthly, using the institutional theory, the study also responds to calls from previous studies to address institutional factors in public procurement which influence the implementation of SME oriented public procurement policies, such as ISD initiatives (Patil, 2017; Grandia and Meehan, 2017; Loader, 2017; Hawkins, Gravier and Randall, 2018; Cheelo and Liebenthal, 2020). While the preceding studies explicitly and subtly acknowledge the influence of institutional factors in implementing ISD initiatives, they have not addressed them in their studies. This research contributes to the literature by demonstrating the moderating role of institutional factors, namely regulatory compliance, and government support, on the relationship between ISD initiatives and KT. The study establishes a significant moderating role for regulatory compliance on KT for the Preferential scheme

and NCC training. The research study also demonstrates that the relationship between NCC training and KT is consistent at all levels of government support.

Fifthly, most previous studies in supplier development have relied on a single theoretical perspective, particularly the knowledge-based view, resource-based view, and relational view, which feature prominently in supplier development. The current research invokes three theories, namely the knowledge-based view, AC, and institutional theories, to comprehend the multifaceted nature of ISD initiatives in the construction industry. ISD initiatives are knowledge donating activities, hence the knowledge-based view. However, as previous studies indicate, KT alone may not be sufficient to impact on performance without AC. AC, which is the organisational capability of knowledge acquisition, assimilation, transformation and application, is critical to have any meaningful impact on organisation performance (Cohen and Levinthal, 1990; Todorova and Durisin, 2007; Balle *et al.*, 2020). Therefore, AC theory provides the theoretical lens as a mediating variable between KT and operational performance.

Furthermore, ISD initiatives are implemented within the umbrella of SME oriented public procurement policies (Patil, 2017; Loader, 2017; Grandia and Meehan, 2017; Hawkins, Gravier and Randall, 2018). Therefore, the institutional theoretical lens is vital in understanding how institutional factors, such as regulatory compliance and government support, moderate the relationship between ISD initiatives and KT. Additionally, this study responds to the call by Kauppi (2013) to extend the institutional theory to the field of operations and supply chain management.

Finally, regarding practical implications, the research suggests prioritising direct ISD initiatives (the 20 per cent subcontracting policy and NCC training), which stimulate KT and enact the binding legislation on specific government-funded projects, to ensure a definitive subcontracting environment for local contractors. Moreover, findings from the qualitative study indicate that there is no clear distinction between a citizen and a local supplier. Ideally, a citizen supplier is a company that is wholly (100%) owned by Zambian citizens. However, the CEEC Act No 9 of 2006, statutory instrument number 36 of 2011 and circular number 3 of 2013 only provide for citizen influenced, empowered, and owned companies with equity stakes ranging from 5-25%, 25-50% and 50.1% respectively. This limitation is echoed in the Zambian Public Procurement Act No 12 of 2008 and the public procurement regulations of 2011. For example, to move ahead, it is proposed that the above inconsistencies can be addressed by harmonising legislation in the construction industry. Therefore, the study recommends revisiting these inconsistencies in the future amendments of these laws governing ISD initiatives in the construction industry.

1.8 Ethical Considerations

Ethical considerations should be taken at every stage of research from problematisation, data collection, and reporting the research findings (Burns and Burns, 2008). To ensure the integrity and quality of the research, the primary ethical considerations for this research included upholding the participants' rights, such as voluntary participation, informed consent, right to privacy, and confidentiality. Eight steps were therefore taken to protect research data and participants, as follows:

1. An email was sent to all respondents, both for the interviews and questionnaire survey, explaining the purpose of the study and why they were nominated to participate in the research. The researcher sought their consent to participate.
2. The study was reviewed for Ethical Clearance and cleared with the ethical approval number HSSREC/00000717/2019.
3. Respondents were informed that participating in the study was voluntary, and by participating, they granted the researcher permission to use the responses.
4. Respondents were also informed, before participating, that they were at liberty to decline to participate or withdraw from the study at any time, with no adverse consequences.
5. Respondents were also informed that there was no monetary gain from participating in the study.
6. The interviewees were also requested to sign the consent form, before the interview, to demonstrate that they understood the content and purpose of the study.
7. The researcher also requested that the respondents sign the consent form, before participating in the research survey, to demonstrate that they understood the content and purpose of the study.

The above steps were undertaken to enhance the integrity of the findings, and also to ensure that the study conformed to ethical standards of contemporary research in business and management studies, as demanded by the University of Kwazulu-Natal.

1.9 Scope of the study

Zambia has a population of approximately 17 million and covers an area of about 752,618 square kilometres (Central Statistical Office, 2019). The population density is relatively low, at 22 persons per square kilometre compared with an average of 44 for sub-Saharan Africa (Cheelo and Liebenthal, 2020). The non-coastal geographical nature of the country makes infrastructure development one of the critical areas for improving socio-economic activities. It has been cited as key to reducing the cost of doing business (National Council for Construction, 2017). Eyiah (2004) argues that the link between the construction industry and the broader economy has been theoretically

and empirically recognised. The development of the construction industry is a powerful engine for economic development, and this is evident in developing countries where the supply of infrastructure is insufficient (Cheelo and Liebenthal, 2018; Cheelo and Liebenthal, 2020). The case of Zambia is typical of the current position of infrastructure in many developing countries. Currently, the construction industry contributes approximately 9.3 per cent of the gross domestic product (GDP), with an average employment rate of 3.8 per cent of the workforce (7NDP, 2017). The contribution of the industry to the economy makes it a very strategic sector for national development and regional integration.

The research focuses on local contractors in the construction industry who have benefited from ISD initiatives over the last three years, from September 2017 to September 2019. This is an appropriate timeframe for any capacity building initiative to yield tangible results in terms of facilitating KT and performance improvement, as suggested by Gosling *et al.* (2015) and Nagati and Rebolledo (2012). Furthermore, SMEs have gained prominence in policy debates and public procurement policy because of the critical role they play in economic development, despite challenges such as a lack of resources and internal capacity constraints. Creating opportunities through public procurement policies, such as ISD initiatives, is essential for the delivery of inclusive development.

The research population for this study consists of 1,649 local contractors registered with the NCC in Zambia (National Council for Construction, 2017). The NCC registers contractors in different categories within a six-tier grading system. In the current research study, only four categories (i.e. B- general building and housing; C-general civil engineering works, R-general roads and earthworks and ME-mechanical engineering) were considered from grades 3 to 6. The NCC's six-tier grading system was used as a basis for the stratification of the population into a combined sample size of 605. The sampling framework consisted of local contractors from the provinces of Lusaka and Copperbelt, representing approximately 57 per cent of all registered contractors in Zambia (National Council for Construction, 2017). Lusaka is the capital city of Zambia.

On the other hand, the Copperbelt Province is considered to be the economic hub of the country due to the concentration of mining activities. Mining is the main economic stay in Zambia, accounting for about 66 per cent of its export earnings (World Bank, 2015). Consequently, the two selected provinces have the highest concentration of economic and construction activities in Zambia and are fairly representative of the population of the industry.

The research study falls broadly within the scope of public procurement policy and supply chain management and focuses specifically on supplier development through SME oriented public procurement policies. The independent variables in the study are the 20 per cent subcontracting

policy, Preferential and Reservation schemes, NCC training and Construction Finance Initiative. The dependent, mediating, and moderating variables are KT, operational performance, AC and regulatory compliance, government support.

1.10 Contextual terms used in the study

1.10.1 Supplier

Supply chain research is examined from both the buyer and the supplier perspectives. The buyer is usually identified as a focal point of analysis with its upstream tier 1, tier 2, tier 3 up to tier 'n' suppliers, and downstream customers, including tier 1, tier 2, tier 3 up to tier 'n' customers (Chen, 2015). The typical construction supply chain can be described in three tiers. Tier 1 consists of the main contractor in a commercial relationship with the client, while a subcontractor in direct contract with tier 1 main contractor is termed as tier 2. Other subcontractors and material suppliers to a tier 2 subcontractor, the sub-subcontractors, fall under tier 3 (Saini, Arif and Kulonda, 2019).

The study focuses on the relationship between tier 1 suppliers (main contractor) and tier 2 subcontractors, and their interactions. Suppliers in the construction industry are widely known as contractors. This refers to the contractual arrangement made between one organization, whose role is to provide works towards the construction of a project (the supplier), and another organisation that procures the project works (buyer) on behalf of the client (e.g. government) (Gosling *et al.*, 2015). In modern construction, the relationship between the supplier and the buyer is exceptionally complex. The traditional role of the contractor has been extended to include other considerations during the construction process. In the current document, the terms 'supplier' and 'contractor' are used interchangeably and defined as the local contractor that directly (i.e., tier 2) provides the main contractor (i.e. tier1) with subcontracting works (Eyiah, 2004).

1.10.2 Supplier development

Supplier development[1] is a bilateral buyer-supplier relationship that involves a purchasing organisation's efforts to improve the performance and capabilities of the supplier organisation, which in turn contributes to the short-term or long-term supply needs of the buyer (Handfield *et al.*, 2000; Modi and Mabert, 2007; Friedl and Wagner, 2012). The current research focuses on the types of supplier development that ultimately facilitate KT. Additionally, supplier development can be direct or indirect (Wagner, 2010; Krause, 2014). The direct approach includes on-site visits, training and education programmes, personnel exchanges, and buyer-specific investment into the physical or

[1] In the construction industry, the term 'supplier development' is narrowed to the contractor development programme. However, it is too narrow and lacks theoretical rigour, hence the use of supplier development. See Dapaah, Thwala and Musonda, (2016).

human resources of the supplier, and is characterised by buyer involvement (Modi and Mabert, 2007; Sucky and Durst, 2014; Krause, 2014). Supplier development may also take supplier evaluations and feedback characterised by passive buyer involvement (Wagner, 2010). The current research study focuses on both types of supplier development in order to understand their effect on KT.

1.10.3 ISD initiatives

Predicated on public procurement policy, Zambia has implemented some ISD initiatives to build the capacity building for local contractors. One such category of ISD initiatives is through the CEEC Preferential and Reservation schemes, which supports citizen-owned enterprises to contribute to economic activities in Zambia (Ministry of Commerce Trade and Industry, 2018). Moreover, the NCC training focuses on both public and private organisations through the training of local contractors (National Council for Construction, 2017).

Furthermore, the RDA has developed a 20 per cent subcontracting policy for road construction projects. In 2013, the Zambian government introduced a policy that local contractors should execute at least 20 per cent of all road contracts awarded by central, quasi-autonomous institutions and local governments, as part of capacity building (Road Development Agency, 2016). Through the RDA and the NRFA, the Construction Finance Initiative is another initiative in the construction industry. The Construction Finance Initiative aims to develop supplier capacity by offering convenient access to finance for local contractors (Road Development Agency, 2016). These government-sponsored programmes aim to qualify local contractors to enter the road construction industry market, which international companies have dominated for many years (National Council for Construction, 2017).

1.10.4 SMEs

To date, the definition of an SME has not reached a universal consensus due to different legislation, size of enterprises, location, unique characteristics and various applications of the term (Ayyagari, Beck and Demirguc-Kunt, 2007). The EU (2015) defines a micro-enterprise as an enterprise that employs fewer than 10 persons, with an annual turnover and total asset value of EUR 2 million. A small enterprise employs fewer than 50 persons, with a maximum annual turnover and asset value of EUR 10 million. Finally, a medium enterprise employs fewer than 250 persons, with a maximum annual turnover of EUR 50 million and a maximum asset value of EUR 43 million. Elsewhere, Megginson, Byrd and Megginson (2008) provide an American contextual definition of very small, small and medium enterprises with less than 20, 20 to 99, and less than 500 employees, respectively. According to the World Bank definition, a small enterprise has less than 50 employees, with an annual turnover and total asset value of USD 3 million. In comparison, a medium enterprise

has more than 50 but less than 300 employees, with an annual turnover and total asset value of USD15 million.

However, the definition of 'smallness' in the construction industry is even more complicated when defining small contractors. Due to the widespread practice of subcontracting, the number of employees would not be a good indicator of size. Again, because of a lack of consistency and certainty in the workload of contractors, and the tendency of projects to spread beyond one financial year, the annual turnover is also not a useful benchmark. Moreover, capital holding is not a good determinant of the company size in the construction industry, because of the variety of methods that can be used to perform a specific work item. Writers define a 'small contractor' differently. For the current study, a small contractor is described as a company operating at or near the basic entry-level in the construction industry, with limited physical resources, typically as a sole proprietorship or a simple partnership, and with the owner-manager engaged in most of the critical activities of the business (Eyiah, 2004). This demarcation allows the current research to consider only active local contractors in the construction industry whom the NCC registers from grade 6 to grade 3. The NCC is a legislative body that regulates and develops capacity through training in the construction industry in Zambia (National Council for Construction, 2017).

1.10.5 Major projects in the construction industry

The critical projects for the construction industry, currently, in Zambia include Link Zambia 8000, pave Zambia 2000, the L400, the Kazungula bridge financed by the government of Botswana and Zambia, the Axle load control, and the regional tolling programme. Additionally, the government has recently commissioned the Lusaka decongestion project, C400 township road rehabilitation projects in the provinces of Lusaka and Copperbelt. Other major construction projects include the expansion of Kenneth Kaunda and the construction of Copperbelt airports. These projects have a combined budget of around $8 billion (GRZ, 2014; Road Development Agency, 2016) and are, therefore, very strategic to the government of the Republic of Zambia. One of the strategic roles in the implementation of this project is the capacity development of local contractors using ISD initiatives. The implementation of these strategic projects partly motivated the crafting of the current thesis.

1.11 Structure of the study

The thesis is structured around 9 chapters in order to address the research objectives.

Chapter 1: Introduction and background

Chapter 1 presents the introduction and background of the study from a theoretical and contextual perspective. Furthermore, the chapter sets out the rationale and problem statement, the research objectives, and the questions. The chapter also outlines motivation and research study contribution, the scope, contextual terms, and the structure of the study.

Chapter 2: Nexus of supplier development, KT and performance

Chapter 2 provides a comprehensive review of empirical studies conducted within the context of supplier development and ISD initiatives on KT, AC, institutional factors, and operational performance. Literature focuses on how ISD initiatives influence KT and subsequently, operational performance. Additionally, the mediating role of AC on KT and operational performance, and how institutional factors moderate the relationship between ISD initiatives and KT, are reviewed and synthesised.

Chapter 3- Public procurement policy and ISD initiatives

The current research is predicated on public procurement policy and regulations; therefore, chapter 3 reviews the public procurement policy implications on socio-economic development. The chapter also reviews ISD initiatives in Zambia and how they support the capacity development of local contractors.

Chapter 4: Theoretical and conceptual framework

Chapter 4 focuses on the theoretical underpinnings of the research: the knowledge-based view, AC, and institutional theories. The theoretical development leads to developing the conceptual framework from the extant literature and hypotheses development.

Chapter 5-Methodology and methods

Chapter 5 explains the procedure in conducting the research work and methodological justifications for the choices during the research process. The chapter also outlines the rationale for the choices made by the researcher. In addition, the chapter explains how variables in the study were measured, and concludes with a discussion of how validity, reliability and ethical issues were addressed in the research study.

Chapter 6-Qualitative data analysis

Chapter 6 presents the qualitative research analysis of the interviews, in order to address the institutional factors influencing the implementation of ISD initiatives, and partly the effectiveness of KT. The findings provide a contextual understanding of the institutional factors influencing the implementation of ISD, which are crucial for discussing and interpreting findings in Chapter 8.

Chapter 7-Quantitative data analysis

Chapter 7 presents the quantitative research analysis from the structured questionnaire survey in order to address the key objectives of the study. These include examining the ISD initiatives associated with KT, the effectiveness of KT on the operational performance of local contractors, the mediating role of AC on the relationship between KT and the operational performance of local contractors, and the moderating role of institutional factors on the relationship between ISD initiatives and KT.

Chapter 8-Discussion of findings

Chapter 8 discusses the findings of both qualitative and quantitative analyses. The findings are discussed in relation to the extant literature on supplier development, KT, AC and institutional factors. The chapter synthesises the findings of the entire thesis.

Chapter 9-Conclusions and recommendations

Chapter 9 summarises the findings concerning the research objectives. The chapter further explains the theoretical contribution of the thesis and its recommendations. The chapter concludes with an outline of its limitations and suggestions of avenues for future research.

1.12 Chapter summary

Chapter 1 has presented the introduction, background, and rationale of the thesis. The purpose, objectives and research questions of the study have also been presented, followed by the proposed conceptual framework and hypotheses. The chapter has outlined the research justification and its contribution to theory and practice. Furthermore, ethical issues for qualitative and quantitative studies, such as ethical research approvals, informed consent, voluntary participation, and data management, are addressed during and after the research study. The chapter has outlined the scope and structure of the thesis. Lastly, the chapter has presented key contextual terms used in the thesis to guide the readers on how they apply in the context of the current research.

The next chapter focuses on the traditional literature review on the nexus of supplier development, ISD initiatives, KT, AC, institutional factors, and operational performance.

CHAPTER 2

NEXUS OF SUPPLIER DEVELOPMENT, KT AND PERFORMANCE

2.1 Introduction

A literature review is an essential aspect of academic inquiry that allows the researcher to establish what is known and unknown to specify a research question that fills an existing gap in the literature (Tranfield, Denyer and Smart, 2003; Sekaran and Bougie, 2016). The two main approaches to literature review are traditional 'narrative' and systematic literature review. A traditional literature review is a thorough, critical, and objective examination of the present knowledge on a specific topic to identify gaps or inconsistencies (Sekaran and Bougie, 2016). In contrast, the systematic literature review takes a more structured approach because it focuses on identifying critical scientific contributions to a field or research question (Tranfield, Denyer and Smart, 2003). A systematic literature review begins with a research question and identifies keywords to guide data collection and analysis.

Chapter 2 focuses on the traditional literature review, an appraisal of the existing literature to identify gaps or inconsistencies in the body of knowledge. This approach led to sufficiently focused research questions and hypotheses for the research. In line with the preceding, chapter 2 is organised as follows. Section 2.2 presents an overview of the importance and prevalence of supplier development. Section 2.3 focuses on the approaches to supplier development, followed, in sections 2.4 and 2.5, by an argument around the differences between private and public sector supplier development and ISD initiatives. Section 2.6 looks at KT in supplier development. The section distinguishes between tacit and explicit knowledge, emphasising the implications of KT in supplier development. Section 2.7 focuses on AC in supplier development. The following section then outlines the institutional factors in supplier development, specifically the regulatory compliance and government support, in Section 2.8. Section 2.9 discusses the operational performance, and Section 2.10 presents the gaps identified in existing literature, which the research addressed in the data analyses chapters. Section 2.11 provides the chapter summary.

2.2 The importance and prevalence of supplier development

Supplier development began in the automotive industry as early as post-World War II, with Japan leading the programme (Wagner, 2006). The concept was initiated by leading automotive companies such as Toyota and Honda (Krause, Handfield and Tyler, 2007; Marksberry, 2012; Chen, Ellis and Holsapple, 2018). However, the first scientific study on supplier development is attributed to Leenders (1966), who described supplier development as any effort by the manufacturer to increase

the number of capable suppliers to improve their performance (Leenders, 1966; Krause, Handfield and Tyler, 2007). Furthermore, Hahn, Watts and Kim (1990) contributed to the early studies on supplier development by proposing a conceptual framework of organisational decision-making processes associated with the supplier development programme. Since Leenders' work, supplier development as a field of inquiry has attracted increased attention from researchers using more sophisticated methods of study to understand the increasingly complex buyer-supplier relationships. The proliferation of supplier development is slowly being extended to public procurement, through SME oriented public procurement policies, to support the engagement of SME businesses in economic activities.

Sucky and Durst (2013) assert that supplier development is one of the top priorities, for improving organisational performance, by most top management in leading organisations. In their comprehensive review of 40 large scale publications, Sucky and Durst (2013) add that supplier development has gained significant interest in academia and practice. Furthermore, in their extensive literature review of supplier development and buyer-suppliers relationship strategies, Sillanpää, Shahzad and Sillanpää (2015) found that supplier development and buyer-suppliers relationship have attracted considerable interest from both academics and corporate organisations. They recommend that buying organisations consider suppliers as strategic partners because of their critical role in enhancing organisational competitiveness. Therefore, investment in supplier development should not be taken as any other operational cost.

Handfield *et al.* (2000) posit that an average manufacturing company spends over 50 per cent of its revenue on procuring various inputs from a network of suppliers. Consequently, suppliers have a significant impact on the buyer's performance outcomes. A supplier influences the cost structure of the buying organisation, as the primary source of inputs, and this has increased significantly in an era of information and communication technology that facilitates the exchange of a significant amount of information, and the outsourcing of non-core activities. The cost and quality of the product or service on the market is a combination of the capabilities of the buying organisation, together with the network of suppliers supplying various inputs to the buying organisation (Modi and Mabert, 2007). The significant influence a supplier has on buyer performance underscores the importance of creating a stable and robust supply network of relationships, as opposed to an opportunistic transactional approach to supplier management.

Sucky and Durst (2013) and Christopher and Gaudenzi (2009) further argue that the significant paradigm shift of contemporary business is that organisations no longer compete as autonomous businesses, but rather as supply chains through collaborations. Supply chain

collaborations underline the importance of buyer-supplier collaboration for organisational competitiveness. This point is reiterated by Monczka *et al.* (2010), who affirm that innovative organisations that have traditionally focused on internal R&D are now dependent on collaborations within supply networks to enhance efficiency, in order to concentrate on core competencies. Organisations thus no longer depend exclusively on internal core competencies for competitiveness, but instead on joint efforts across the supply network (Kotabe, Martin and Domoto, 2003).

As a result of the preceding discussion, whenever a buying organisation is not satisfied with the performance of its suppliers because of unsatisfactory performance, it can explore many options (Glock, 2017). The first option is to invest time and resources to improve the performance and capabilities of their current suppliers, using defined criteria. The second option is to insource the items initially procured from external suppliers through vertical integration. The third option is to switch to alternative suppliers that can meet the demand, and the fourth is to use some combination of the three options (Krause, Scannell and Calantone, 2000; Wagner, 2006; Friedl and Wagner, 2012).

All three options are possible, depending on the nature of the sourced items, whether non-critical, leverage, or strategic (Handfield *et al.*, 2000). For non-critical items, switching suppliers could be the best option. However, switching suppliers may not be easy for strategic items, and it may be essential to protect the supply source while concentrating on core activities; hence, supplier development may be the only viable option (Friedl and Wagner, 2012). Wagner (2010) argues that the third option, which involves switching the supplier to a more capable supplier, may not be feasible if alternative suppliers are not available, or if the switching costs are excessively high.

Furthermore, option two, which involves insourcing or vertical integration, is only viable if the buyer has the necessary capacity and initial capital to invest (Wagner, 2006). Vertical integration may require substantial investment and may conflict with the focus on the core competencies of the organisation, and outsourcing of non-core activities (Wagner, 2010; Monczka e*t al., 2*010). Glock (2017) argues that supplier development might be the preferred option, in many cases, compared to vertical integration, or supplier switching, for improving supplier operations such as cost, quality, delivery times, and even strategically enhancing the buyer's supply base.

The study focuses on the first option of investing in and developing the performance and capability of the supplier, commonly referred to as supplier development (Modi and Mabert, 2007; Krause, 2014). Supplier development is any activity initiated by a buying organisation to improve the performance of its suppliers (Krause, Handfield and Tyler, 2007). Supplier development is becoming increasingly important since the unavailability of capable suppliers may further hamper supplier switching, and vertical integration may not be in line with the organisation strategy of

focusing on core competencies (Wagner, 2006). Supplier development has broad implications on the organisational units beyond procurement. Suppliers significantly impact the bottom line of the organisation (Chen, Ellis and Holsapple, 2015). For this reason, supplier development has received significant interest as a subject of inquiry in procurement and supply chain management. The following section discusses the different approaches to supplier development.

2.3 Approaches to supplier development

There is no universal definition of supplier development, and several publications have developed their understanding using different names and approaches (Sillanpää, Shahzad and Sillanpää, 2015; Dalvi and Kant, 2015; Chen, Ellis and Holsapple, 2018). However, most studies converge on the notion that supplier development is a form of buyer-supplier collaboration that involves any deliberate effort on the part of the buying organisation to improve the performance of the supplier in order to meet supply needs (Handfield *et al.*, 2000; McKevitt and Davis, 2014; Krause, 2014). Dalvi and Kant (2015) add that supplier development is a joint endeavour between the purchasing company and the supplier to enhance the performance and capabilities of the supplier continually. Similarly, supplier development is a long-term cooperative effort by an organisation to upgrade the technical capability of its supplier (Nagati and Rebolledo, 2012). Recently, Chen, Ellis and Holsapple (2018) propagated the knowledge management perspective of supplier development as a series of direct and indirect knowledge management activities by the buying and supplying organisation. The main objective is to meet the supply needs of the buying organisation by improving the performance of its supplier through increasing the knowledge resources of its suppliers.

In essence, supplier development aims to improve the supplier organisation in two ways, by improving the product or service provided by the supplier, and by improving the capabilities of the deficient supplier (Wagner, 2010). The current research study focuses on the former, where the objective of supplier development is to improve the operational performance of the local contractor, through improvements in project quality delivery, budget, and schedule, while adhering to safety and health standards. Table 2-1 summarises several approaches to supplier development common in literature and their intended objectives.

Table 2-1: Summary of approaches to supplier development

Activity	Explanation	Representative literature
Supplier training	Provide training or education to supplier's personnel.	Krause *et al.*, 2000; Krause and Scannell, 2002; Wagner, 2006; Modi and Mabert, 2007; Nagati and Rebolledo, 2012
Supplier evaluation	Evaluate supplier's performance in a formal or informal process.	Krause et al., 2000; Krause and Scannell, 2002; Modi and Mabert, 2007; McKevitt and Davis, 2014
Information sharing	Share/exchange information (e.g., product, quality, market intelligence) to help suppliers.	Krause and Scannell, 2002; Wagner, 2006; Dalvi and Kant, 2015
Direct incentive	Recognise supplier's achievements in the form of awards.	Krause et al., 2000; Krause and Scannell, 2002; Chen *et al.*, 2015
Joint action	Collaboration with suppliers in some areas of common interest	Krause et al., 2000; Chen *et al.*, 2015
Supplier involvement in NPD	Involve suppliers in some activities such as NPD.	Lawson et al., 2015; Dalvi and Kant, 2015; Sillanpää *et al.*, 2015;
Technical assistance	Provide technical support or solve technical problems.	Modi and Mabert, 2007; Chen et al., 2015
Supplier certification	Use a certification programme to certify supplier's quality.	Krause et al., 2000; Krause and Scannell, 2002; Modi and Mabert, 2007; Sillanpää *et al.*, 2015
Plant (company) visits	Visit regularly to the supplier's plant/site to get information.	Modi and Mabert, 2007; Chen et al., 2015
Performance expectation	Increase or set supplier performance goals.	Chen *et al.*, 2015; Dalvi and Kant, 2015
Financial support	Provide capital for new investments or direct investments.	Krause and Scannell, 2002; Wagner, 2006; Dalvi and Kant, 2015
Co-location (staff secondments)	Assign support personnel to the supplier's facilities, or engineers to provide support to the supplier.	Friedl and Wagner, 2012; Chen *et al.*, 2015; Dalvi and Kant, 2015
Invite supplier to visit	Invite suppliers' personnel to the buyer's site.	Chen et al., 2015; Dalvi and Kant, 2015
Managerial assistance/mentoring	Provide support/assistance in quality management and inventory management.	McKevitt and Davis, 2014; Chen *et al.*, 2015; Dalvi and Kant, 2015
Dynamic communication	Communication and interaction with the supplier's personnel	Wagner, 2006; Chen et al., 2015
Physical asset support	Provide equipment, tools, or/and new production line.	Krause and Scannell, 2002; Wagner, 2006; Dalvi and Kant, 2015
Competitive pressure	The buyer applies the competitive force of the market through competitive bids from multiple suppliers.	Krause et al., 2000; Krause and Scannell, 2002; Modi and Mabert, 2007; Sillanpää, *et al.*, 2015
Promise of business	The promise of current or future benefits/business, or extension of long-term contracts to suppliers.	Modi and Mabert, 2007; Chen *et al.*, 2015
Supplier rating	Rank supplier's performance through a rating system.	Krause et al., 2000; Krause and Scannell, 2002; Modi and Mabert, 2007; Chen *et al.*, 2015
KM between the buyer and supplier	Knowledge acquisition, selection, generating, assimilation, emission, measurement, control, coordination, and leadership	Chen *et al.*, 2015; Chen *et al.*, 2018

Note: NPD-New Product Development; KM-Knowledge Management. Source: Researcher (2020)

Table 2-1 above shows that most of the supplier development activities are related to training, supplier evaluation, information sharing, investment in the supplier's business, and, more recently, knowledge management. However, most supplier development approaches are predominantly in the private sector (Modi and Mabert, 2007; Chen, Ellis and Holsapple, 2015; Lawson, Krause and Potter, 2015; Gosling *et al.*, 2015).

2.3.1 Direct and indirect supplier development

Supplier development can also be viewed from the level of involvement of the buying organisation, commonly referred to as indirect and direct supplier development (Krause, 2014). Wagner (2010) distinguishes between indirect and direct supplier development and their impact on performance outcomes. Indirect supplier development, also known as externalised or narrow supplier development, involves little resource commitment by the buying organisation. Activities in indirect supplier development include communication, buying organisation incentives, competitive pressure, evaluation and feedback (Wagner, 2010; Krause, 2014). Direct supplier development, also understood as internalised, encompasses close interactions and relation-specific investments that involve the dedication of human and capital resources to the supplier. The latter is also associated with KT and includes training, on-site technical assistance, employee exchanges and joint problem-solving (Wagner, 2010; Arroyo-López, Holmen and de Boer, 2012; Krause, 2014).

Furthermore, Modi and Mabert (2007) refer to direct supplier development activities as operational KT activities that involve direct interactions between the buying organisation and the supplier employees. Arroyo-López, Holmen and de Boer (2012) argue that all categories of supplier development comprise a high level of involvement. However, only human and resource investment in the supplier organisation stimulate KT. Additionally, direct activities such as cross-functional teams, inter-organisational teams, supplier employee training in various operational activities, and employee exchanges also stimulate KT (Arroyo-López, Holmen and de Boer, 2012). The distinction between indirect and direct supplier development is essential in understanding their effect on KT and subsequently, the operational performance of the supplier. The current research focuses on indirect (Preferential and Reservation schemes; Construction Finance Initiative) and direct (the 20 per cent subcontracting policy; NCC training) ISD initiatives. Nevertheless, there is a dearth of research about their implications on KT in the construction industry. Therefore, it remains unclear whether indirect and direct ISD initiatives have the same effect on KT as the preceding literature suggests.

2.4 Supplier development: private versus public sector

Most of the studies on indirect and direct supplier development are predominantly from the private sector. However, similar practices are evident in SME oriented public procurement policies, to stimulate KT, from buying organisations to suppliers through ISD initiatives. There are, however, significant differences between supplier development practices in private and public sector procurement. For example, market forces control the private sector, in contrast, the public sector extensively uses regulatory controls. From the procurement perspective, McKevitt and Davis (2014) argue that public procurement focuses less on relationship building, and more on how to get competitive prices, and is generally risk-averse. In their study of how SMEs engage in public procurement, Woldesenbet and Worthington (2019) conclude that public procurement has high levels of formalisation designed to enhance public procurement principles, which also act as barriers to SME participation in public procurement.

Literature suggests that there is some evidence of supplier development in the public sector, although most of it focuses on anecdotal evidence and case studies with limited research rigour (Arráiz, Henríquez and Stucchi, 2013; McKevitt and Davis, 2014). McKevitt and Davis (2014) contend that, in the public procurement sector, adopting supplier development has been slow mainly due to the rigidity of the procurement legislation, and regulations that place limits on how public buyers communicate with suppliers outside of contractual obligations. Moreover, while public procurement legislation has established procedures for supplier selection and evaluation, there is little guidance for supplier development within the public sector (Arlbjørn and Freytag, 2012). Limited guidance on how to approach supplier development in the public sector makes it challenging to implement supplier development.

However, some developed and developing countries have developed SME oriented public procurement policies to support ISD initiatives in public procurement (Loader and Norton, 2015; Flynn, 2018; Woldesenbet and Worthington, 2019). For example, Patil (2017) conducted an extensive study of a public procurement policy for SMEs in India and found different performance outcomes on SME procurement targets. Similarly, Hawkins, Gravier and Randall (2018) argue in their study that governments have been spending considerable resources in supporting SMEs, through various ISD initiatives, even though performance outcomes are not commensurate to the investments. In the construction industry, benefits from supplier development have been registered, through public procurement policies, in the public procurement of infrastructure projects (Nakabayashi, 2013; Kidalov, 2013). However, the findings of McKevitt and Davis (2014), on the challenges of supplier development in public procurement, ignore the opportunities that public procurement policies

provide for the integration of SMEs in the economy, as other studies have shown (López, Holmen and Boer, 2012; Arráiz, Henríquez and Stucchi, 2013; Patil, 2017).

Furthermore, supplier development in public-sector procurement varies from that of the private sector. The majority of public sector buyer-supplier interactions are prescriptive by nature (Arlbjørn and Freytag, 2012; World Bank, 2017; Woldesenbet and Worthington, 2019), whereas, in the private sector, supplier development is usually motivated by an organisational strategy. Therefore, the propensity of private companies to engage in KT through supplier development is higher when sourcing strategic and high-value items than non-strategic items (Squire, Cousins and Brown, 2009; McKevitt and Davis, 2014). Kraljic (1983) categorises strategic items as high-value items and high risk, as characterised by their sourcing market complexity and high impact on company profitability. Additionally, supplier development in the private sector is based on mutually beneficial, long-term commercial relationships founded on trust, commitment, and mutual benefit (Arráiz, Henríquez and Stucchi, 2013).

Conversely, the goal of supplier development in the public sector is socio-economic growth, which is generally referred to as value for money (McKevitt and Davis, 2014). Public procurement focuses more on how to get a competitive price, as per the universal values of public procurement such as accountability, efficiency, economy, fairness and value for money (McKevitt and Davis, 2014; Ibrahim *et al.*, 2017; Asamoah, Annan and Rockson, 2019). However, public procurement offers some opportunities within the framework of policies and regulations, particularly to SMEs, facilitating their participation in economic activities (Loader, 2015). The government's objective under such initiatives is to support SME participation in the economy, by stimulating buyer KT to suppliers, which in turn improves their competitiveness (Arroyo-López, Holmen and de Boer, 2012). Nevertheless, the importance of public procurement, as a critical lever for achieving wider socio-economic development through ISD initiatives and the critical role of SMEs in national development, has not received much attention compared to the private sector strategy-driven supplier development (Loader, 2017; Grandia and Meehan, 2017; Woldesenbet and Worthington, 2019).

Another vital distinction is that the buyer directly delivers the supplier development programme in private sector supplier development. In contrast, supplier development in the public sector is usually delivered by third parties using public funds (Grandia and Meehan, 2017; Hawkins, Gravier and Randall, 2018). For example, a lead contractor who wins a public tender may be compelled, through public procurement regulations, to subcontract a percentage of the contract to local contractors as part of KT and capacity building (Maréchal and Morand, 2012; Kidalov, 2013).

Furthermore, supplier development in the private sector uses a limited number of strategic suppliers after they have undergone evaluation and certification (Modi and Mabert, 2007; Nagati and Rebolledo, 2013). Evaluation and certification are prerequisites for effective supplier development. However, such practices may not apply to the public sector. For example, supplier development in the public sector is not limited to strategic suppliers, but rather to all SMEs that satisfy the minimum requirements, since it is a channel for promoting socio-economic development by enhancing the competitiveness of SME suppliers (Arrowsmith, 2010).

Nevertheless, a few exceptions exist. For example, in Mexico, supplier appraisals are conducted before engaging in the supplier development programme (Arroyo-López, Holmen and de Boer, 2012). Suppliers who do not pass the initial evaluation are redirected to receive basic mandatory training through the national supplier development programme, before being reassessed for participation in the programme (Arroyo-López, Holmen and de Boer, 2012). Furthermore, supplier development in the public sector adopts a blanket approach where everyone can participate if they are citizens of that country (McKevitt and Davis, 2014). Nevertheless, current studies propose a heterogeneous approach where suppliers with different AC levels can be assigned to different supplier development contents, durations, and routes (Arroyo-López, Holmen and de Boer, 2012).

Therefore, research calls to examine the effectiveness of supplier development delivered through SME oriented public procurement policy is justified, considering that supplier development in the private sector has yielded positive results (Modi and Mabert, 2007; McKevitt and Davis, 2014; Gosling *et al.*, 2015). Consequently, the research study builds on the current debate on supplier development from the private sector and contributes to knowledge by examining the influence of ISD initiatives on KT and subsequently on the operational performance of local contractors. In order to contextualise the current study, the following section discusses the extent of ISD initiatives in the existing literature.

2.5 ISD initiatives

ISD initiatives are supplier development activities coordinated by the government, and its quasi-autonomous institutions, by creating an environment in which networks of local suppliers can develop capabilities through deliberate SME oriented public procurement policies (Arráiz, Henríquez and Stucchi, 2013; Hawkins, Gravier and Randall, 2018). In this context, ISD initiatives make use of subsidies, tax incentives, Reservation schemes by reserving specific contracts for local suppliers, Preferential treatment of local suppliers, subsidised training, and access to customised financial products (Marion, 2007; Kidalov, 2013; Arráiz, Henríquez and Stucchi, 2013). ISD initiatives, in turn, create incentives for large organisations to provide professional advice, technical assistance and

subcontracting of specific works to SMEs, in order to stimulate KT to SME suppliers at a low cost (Arroyo-López, Holmen and de Boer, 2012; Arráiz, Henríquez and Stucchi, 2013; Patil, 2017). The current research focuses on ISD initiatives in the construction industry.

Several ISD initiatives continue to be implemented globally in the construction industry, albeit with different results. For example, Marion (2007) investigated the impact of the bid preferences programme on construction procurement auctions by the Transport Department of California. The study found that the programme resulted in a government loss of surplus from large, low-cost organisations by awarding contracts to high-cost competitors. However, competition between favoured bidders increased, and therefore the overall cost of procurement was reduced. Moreover, Krasnokutskaya and Seim (2011) extended the Marion (2007) study on bid preferences for road construction. They found that the programme significantly increased the chances of winning the contract, for participating contractors, but resulted in a slight increase in government procurement costs. However, Marion (2007) notes that bid preferences, if used solely as the criteria for benefiting from Preferential procurement, may distort organisational incentives. Preferential procurement should, therefore, be applied in conjunction with other criteria when engaging suppliers.

Furthermore, another important type of ISD initiative is the Reservation scheme (set-aside). For example, Nakabayashi (2013) found that 40 per cent of SMEs would be left out of the procurement market if the Reservation schemes were removed, in its study of set-aside schemes in the Japanese construction industry. However, the resulting lack of competition increased the cost of government procurement. Reservation schemes for contractors restrict competition, making the procurement market inefficient (Watermeyer, 2003). Conversely, some scholars argue that the retention of contracts between disadvantaged groups enhance competition for advantageous bidders, which compensates for the loss of efficiency as a result of the Reservation schemes (Nakabayashi, 2013). Ultimately, Preferential and Reservation schemes are designed to build local supplier capacity by giving an advantage to targeted suppliers to access public contracts (Flynn, 2018).

Subcontracting is yet another typical ISD initiative in the public procurement of construction projects. Hartmann and Caerteling (2010) argue that subcontracting is a crucial feature of construction, which contributes up to 90 per cent of the total value of the construction project. Subcontractors supply labour, material, and services to the main contractors. Smyth and Duryan (2020) also acknowledge that subcontracting help to realise cost reductions, efficient project delivery, and risk-sharing in the construction project. The interaction between the main contractor and subcontractor also helps in stimulating KT from the main contractor to the subcontractor.

The main contractor plays a crucial role in providing subcontractors with access to work opportunities in the overall project because they are accountable to the client. The CIDB (2013) asserts that the most important considerations for the main contractor in selecting their subcontractors include the subcontractors' financial capacity, track record of performance, construction management services, and compliance with legislative requirements. The performance of the subcontractor, based on the main contractor's evaluation, is a crucial influence for future business opportunities for the subcontractor (Choudhry *et al.*, 2012).

Maréchal and Morand (2012) argue that, under the subcontracting policy, the government awards a contract to the main contractor with the requirement that the main contractor subcontracts a certain percentage of the contract value to local contractors, as a way of facilitating KT and capacity building. This practice is common in both developed and developing countries. For example, Kidalov (2013) conducted a study in the USA and EU, on SME subcontracting policy, and found that governments in both the USA and EU have adopted laws, policies, and regulations to encourage main contractors to subcontract local contractors. The main emphasis on binding mandatory subcontracting obligations, on the part of the main contractor, is to ensure certain levels of assurance that, when a contract is awarded, part of the scope of work will be subcontracted to local contractors. Furthermore, in terms of the impact of subcontracting on procurement costs, Marion (2007) studied subcontracting requirements, for women and minority-owned enterprises in California, and found significant reductions in government procurement costs. Additionally, Kidalov (2013) asserts that subcontracting facilitates access to public-funded contracts by local contractors, resulting in KT and supplier capacity building.

Furthermore, literature is replete with evidence that training and financial incentives are common types of ISD initiatives that have been adopted in the public sector to build supplier capacity (Modi and Mabert, 2007; Nagati and Cabollebo, 2012; Arráiz, Henríquez and Stucchi, 2013; Gosling *et al.,* 2015). When the supplier has acquired the necessary skills, the financial incentives become critical in helping the supplier to mobilise and procure equipment, to participate in construction projects.

Accordingly, the current research posits that these types of collaborations, between government, main contractors, and local contractors, stimulate KT from main contractors to local contractors and, if correctly leveraged, the capacity building of local contractors. Overall, there is a consensus that ISD initiatives have the potential to contribute to the supplier development of local contractors. However, it is not clear from the literature which ISD initiatives are associated with KT and the efficacy of the ISD initiatives on contractor operational performance.

2.6 KT in supplier development

The effective management of knowledge is a core competence that gives an organisation some competitive advantage (Grant, 1996), because such competencies are held in the intellectual capital of the organisation, its employees and systems (Spekman, Spear and Kamauff, 2002; Giampaoli, Ciambotti and Bontis, 2017; Balle *et al.*, 2020). Arguably, these competencies are not equally distributed in all organisations, because some organisations are better at utilising their competencies to develop their capabilities and outsmart other players (Escribano, Fosfuri and Tribó, 2009; Denford and Ferriss, 2018). Therefore, the uneven distribution of knowledge underscores the importance of collaborations, such as supplier development, to facilitate KT (Chen, Ellis and Holsapple, 2018). Furthermore, it is also challenging and costly for an individual organisation, particularly an SME, to create all the knowledge it needs internally. Therefore this further necessitates the need for supplier development to acquire and exploit knowledge in a relationship (Nagati and Rebolledo, 2012).

KT involves the ability of an organisation to acquire knowledge from the external environment and share it internally to improve its operations through knowledge application for value creation (Blome, Schoenherr and Eckstein, 2014). In the context of the supply chain, KT is a mechanism by which one organisation is positively impacted by the expertise of another experienced organisation (the purchasing organisation) through access to, and acquisition of, external knowledge (Squire, Cousins and Brown, 2009; Zhao, 2013; Kim, Hur and Schoenherr, 2015).

The importance of KT in supplier development shows recognition of the fact that organisations no longer rely solely on internal idiosyncrasies, but are increasingly leveraging knowledge from other players within the supply network (Kotabe *et al.*, 2003; Christopher and Gaudenzi, 2009). Some organisations are better learners and therefore, more experienced. Hence they can extend learning beyond their organisational boundaries so that other members can benefit from the KT (Spekman *et al.*, 2002). For example, Grandinetti (2016) rightly argues that SMEs' access to knowledge produced by others, which often requires interaction between the parties involved, can be a source of performance improvement.

Knowledge management and KT have made headway in supply chain management and supplier development in the recent past (Modi and Mabert, 2007; Chen, Ellis and Holsapple, 2018). For example, Chen, Ellis and Holsapple (2018) conceptualise supplier development as management activities that facilitate the flow of knowledge from the buying organisation to the supplier to achieve organisational performance goals. The current research study focuses on supplier development involving first-order knowledge management activities, that targets local contractors in the

construction industry in Zambia. However, the effectiveness of KT requires an understanding of the types of knowledge, whether tacit or explicit, in order to ensure optimum transfer.

2.6.1 Tacit and explicit knowledge: implications on supplier development

Literature indicating that supplier development creates an enabling environment for KT, and operational performance improvement is plentiful (Nagati and Rebolledo, 2012). However, KT in supplier development does not occur automatically. It requires designing actions that facilitate KT and the ability to acquire and benefit from this knowledge. Extant literature identifies the type of knowledge as one of the critical factors that influences, KT and ultimately affects the performance of the supplier (Wuryaningrat, 2017; Gonzalez and De Melo, 2018). In this section, the research focuses on the two main types of knowledge which may ultimately influence the effectiveness of KT in supplier development.

The two types of knowledge worth considering in this research are explicit and tacit knowledge used to optimise KT in supplier development (Giannakis, 2008). Explicit knowledge is easy to observe and communicate through mechanisms such as buyer-supplier training manuals, policies, standard operating procedures, and regulations. However, tacit knowledge exists in individual contextual interactions such as know-how and is difficult to convey. Table 2-2 summarises the main differences between tacit and explicit knowledge as follows:

Table 2-2: Differences between tacit and explicit knowledge

	Tacit knowledge	**Explicit knowledge**
Definition	Know-how, know-why: skills expressed through performance	Know-about: comprise facts, theories, and instructions
Quality, speed, cost of the transfer	Slow, costly, and uncertain (high stickiness)	Fast, may be costly, accurate (low stickiness)
Diffusion	Difficult to convey	Easier to convey
Residence	General information, experiences, and memories	Books, documents, databases, policy manuals
Complexity	Relatively complex	Relatively simple
Teachability	Not teachable	Teachable
Observability	Not observable	Observable
Codifiability	Difficult	Easy

Sources: Giannakis (2008, p.65) and Cavusgil, Calantone and Zhao (2003, p.9)

Research studies show that tacit knowledge is more relevant to supplier development because it is part of the know-how knowledge of the members of the company. The acquisition of such knowledge requires intensive interaction to facilitate KT from the buyer to the supplier (Rebolledo, Halley and Nagati, 2009; Wagner, 2010). Additionally, Cavusgil, Calantone and Zhao (2003) assert

that explicit knowledge has certain qualities of 'public good' because it can be easily accessed and imitated, whereas tacit knowledge is non-verbalised, and thus unique, useful for innovation purposes. Tacit knowledge is difficult to encode (Giannakis, 2008); therefore, as the encoding cost of tacit knowledge increases, so does its transfer. This characteristic makes tacit knowledge difficult for competitors to access.

Furthermore, if tacit knowledge is leveraged correctly, it can contribute to the performance of the supplier by improving quality, innovation, delivery, and cost reduction. Md-saad, Ghauri and Jedin (2016) postulate that these qualities of tacit knowledge make it a valuable resource to be used in supplier development. For example, Zhao (2013) asserts that tacit KT can begin with an individual, such as a design engineer in the buyer organisation. Through supplier development interactions, the knowledge is transferred into the entire system of the buyer and the supplier organisation. The supplier may then use this knowledge to improve its expertise and innovative capabilities, such as an improved project design, for the benefit of the buyer.

2.6.2 Operational KT activities in supplier development

A pivotal aspect of KT in supplier development is the investment made in the supplier's employees to enhance their learning capabilities, contributing to improved supplier performance (Modi and Mabert, 2007; Arroyo-López, Holmen and de Boer, 2012). The buyer transfers knowledge to the supplier through operational KT activities involving relationship-specific investments, such as the training or education of employees at the supplier organisation, on-site problem solving, and employee exchanges, among others, to improve supplier performance (Modi and Mabert, 2007; Wagner, 2010; Krause, 2014). For instance, Kim (1998) cites a classic example of how Hyundai's first production relied on the divisional team members' experience, and outside engineers from Ford, for tacit knowledge related to its first automobile production in 1967. Hyundai relied on expertise from Ford and many other automobile engineers to harness tacit migratory knowledge from overseas to build capacity for its employees, which significantly improved its automobile production.

Similarly, the Toyota supplier development in the implementation of the Toyota Production System is another typical example of KT in supplier development (Marksberry, 2012). In order to develop supplier capabilities through the adoption of the Toyota Production System, Toyota engaged in supplier training and seconded engineers to supplier organisations as part of supplier development (Wagner and Krause, 2009). Toyota stimulated KT related to work organisation, processes, measurement, and employee motivation within its suppliers and the suppliers benefited from the absorption of this knowledge (Wagner, 2010; Marksberry, 2012). These activities are referred to as

operational KT activities because they involve direct interactions between the buyer and supplier employees, resulting in KT (Modi and Mabert, 2007).

The concept of KT in supplier development has been extended to SME oriented public procurement policy through ISD initiatives. For instance, Arroyo-López, Holmen and de Boer (2012) found that ISD initiatives in Mexico facilitate KT and subsequent improvements of participants' capabilities with sufficient AC. Arráiz, Henríquez and Stucchi (2013) report similar findings in the Chilean supplier development programme, which resulted in increased sales, employment, and the sustainability of SME suppliers and large organisations. Furthermore, Dapaah, Thwala and Musonda (2016), in their evaluation of the contractor development programme in South Africa, found that the programme leads to contractor upgrades in registration status and increased participation in the construction industry. Similar previous studies have contributed to KT in SME oriented public procurement policy initiatives in Australia, Brazil, USA, and the UK (Patil, 2017; Loader, 2017; Hawkins, Gravier and Randall, 2018). However, the preceding studies have been predominantly implemented in developed countries with robust public procurement regimes and organisational capacity. Therefore, it is prudent to extend these studies, through this research, to a developing country context characterised by organisational capacity constraints and a generally weak regulatory regime, as suggested by some studies (Patil, 2017; Ibrahim *et al.*, 2017).

Furthermore, some studies recommend that relationship-specific investment should be preceded by supplier evaluation, certification and feedback, to ensure that the supplier's AC is consistent with effective KT and supplier performance improvements (Squire *et al.*, 2009). AC, and a compatible institutional environment, can enhance an organisation's ability to recognise and leverage valuable external knowledge for commercial value creation (Harvey, Jas and Walshe, 2015). Therefore, Section 2.7 discusses and critiques the concept of AC and how it influences the relationship between KT and supplier operational performance.

2.7 AC in supplier development

2.7.1 Conceptualisation of the AC construct

AC has received significant attention in business and management literature as a critical organisational capability of knowledge management, performance and innovation (Cohen and Levinthal,1990). However, the definition of AC has been a subject of intense debate in various research disciplines (Zahra and George, 2002). Cohen and Levinthal (1990) define AC as a process of knowledge acquisition, assimilation, and exploitation, primarily through R&D activities. Knowledge acquisition includes the identification and interpretation of applicable external information from a range of sources, such as the industry, technology partners, academic research

organisations, and supplier development initiatives (Arroyo-López, Holmen and de Boer, 2012; Zhang, Zhao and Lyles, 2018; Duan, Wang and Zhou, 2020). In the supplier development context, knowledge is acquired from organisational routines in the form of on-site problem solving, personnel exchanges, education and training (Nagati and Rebolledo, 2012; Saenz, Revilla and Knoppen, 2013; Krause, 2014).

Furthermore, knowledge assimilation involves the translation and interpretation of acquired information (Tessa Christina Flatten *et al.*, 2011), and the development of an enabling internal organisational context to facilitate knowledge sharing internally (Balle *et al.*, 2020). This phase requires investment in open communication systems, supportive organisational structure, culture and policies, to ensure a seamless flow of knowledge across the various organisational units (Knoppen, Sáenz and Johnston, 2011; Ali, Musawir and Ali, 2018). Assimilation also involves combining existing and new knowledge to develop new and refined routines to facilitate the conversion and internalisation of knowledge at different organisation levels (Flatten, Greve and Brettel, 2011). Finally, exploitation involves applying knowledge to create commercial value (Harvey *et al.*, 2015). Knowledge exploitation involves applying knowledge for new product development, innovative practices, and the execution of projects that could not have been done in the past (Lane, Koka and Pathak, 2006; Ali, Musawir and Ali, 2018). This capability enables an organisation to incorporate new and existing knowledge into its operations and routinise it (Tessa Christina Flatten *et al.*, 2011). However, this conceptualisation emphasises the availability of prior related knowledge to trigger AC (Knoppen *et al.*, 2011), as highlighted in the next section.

2.7.2 Importance of prior relevant knowledge in AC

Knowledge acquisition does not occur in a vacuum. For an organisation to recognise the value of external knowledge, it should possess relevant prior knowledge. For example, Kim (1998) argues, in the Hyundai Motor Company supplier development study, that effective organisational learning requires AC and intensity of effort, which depends on prior relevant knowledge. Learning efforts depend on the prior relevant knowledge of the organisation, and the intensity of the effort to apply knowledge to solve organisational problems (Denford and Ferriss, 2018). Related prior knowledge in the form of individual knowledge units that are available in an organisation helps to make sense of the knowledge that it already possesses, in terms of where and how it is used. Prior knowledge is critical for recognising relevant external knowledge during knowledge acquisition from external sources, such as supplier development activities.

In the case of a construction company, relevant prior knowledge may include basic construction and maintenance techniques from previous related projects (Dapaah, Thwala and

Musonda, 2016). To expedite knowledge acquisition in supplier development, prior preparation in literature reviews of the supplier organisation, assessments, and site visits is critical (Kim,1998). This implies that, before engaging in supplier development, suppliers ought to prepare adequately for knowledge acquisition by understanding the buying organisation's requirements, and reading literature about the project to be implemented, in order to convert explicit knowledge into tacit knowledge. For example, Duan, Wang and Zhou (2020) recommend technical training as a basis for enhancing AC, because it improves the interaction between individuals or groups and ultimately expands the existing knowledge, and its applications, for value creation.

2.7.3 Potential and realised AC

Zahra and George (2002) extended the definition of AC into the two subcategories of potential and realised AC. Whereas the term potential AC refers to knowledge acquisition and assimilation, realised AC involves the transformation and exploitation of capabilities (Volberda, Foss and Lyles, 2010; Cepeda-carrion, Cegarra-navarro and Jimenez-jimenez, 2012; Balle *et al.*, 2020). Ideally, potential AC compliments realised AC to achieve knowledge exploitation (Duan *et al.*, 2020); however, the two concepts are fundamentally different. For example, potential AC requires agility and creativity to acquire and assimilate knowledge from the external environment, while realised AC relies more on coordination and stability to transform and exploit the knowledge (Cepeda-carrion, Cegarra-navarro and Jimenez-jimenez, 2012; Duan, Wang and Zhou, 2020).

The conceptualisation of potential and realised AC presents AC as a multi-dimensional construct of four components, which changes the definition of AC to "organisational routines and processes by which organisations acquire, assimilate, transform and exploit knowledge to produce a dynamic capability organisation" (Zahra and George, 2002, p.186). Zahra and George focus on the AC efficiency factor ratio by calculating the ratio of realised to potential AC. The efficiency capacity ratio shows that knowledge creation among organisations varies depending on their capacity to transform and exploit knowledge (Volberda, Foss and Lyles, 2010). Cepeda-carrion, Cegarra-navarro and Jimenez-jimenez (2012) rightly conclude that potential AC involves personal internal processes such as reflection, intuition, and interpretation of information. In contrast, realised AC reflects the efficiency of utilising the acquired and assimilated knowledge.

Furthermore, from the extension of AC, knowledge acquisition is conceptualised as the identification and acquisition of new external information relevant to the organisational operations (Todorova and Durisin, 2007). On the other hand, Assimilation is concerned with the inclusion, conversion, and interpretation of the acquired knowledge from the external environment (Zhang *et al.*, 2018). Assimilation, therefore, forms the routines and processes that allow the organisation to

analyse, interpret, and comprehend information. Together, acquisition and assimilation form potential AC (Brettel, Greve and Flatten, 2011; Zahra and George, 2002). Furthermore, knowledge transformation combines new, and prior, knowledge to develop and refine organisational routines that facilitate knowledge conversion and internalisation. This ability helps the organisation to refocus its processes and strategy based on available knowledge (Lane, Koka and Pathak, 2006; Zhang, Zhao and Lyles, 2018).

Moreover, knowledge exploitation is concerned with the application of knowledge, for value creation, by transforming knowledge into operations through the refining of competencies, and the leveraging of new competencies (Brettel, Greve and Flatten, 2011). Consequently, knowledge transformation and exploitation, when combined, form realised AC (Zahra and George, 2002). However, to optimise the four dimensions of AC, it is essential to balance their development. Investment in knowledge acquisition and assimilation alone, for example, may not result in the improvement of performance without the transformation and exploitation of knowledge. Volberda, Foss and Lyles (2010) note that the maximum AC does not necessarily translate into optimum AC. In order to achieve the desired results, equal attention must be paid to potential and realised AC.

Furthermore, Todorova and Durisin (2007) critique the assumptions by Zahra and George (2002), that the four dimensions of AC (i.e. acquisition, assimilation, transformation, and exploitation) are sequential. Knowledge assimilation and transformation are not sequential, but rather alternative processes. For example, Davila *et al.* (2019) argue that, once knowledge is acquired, if new knowledge can be modified to fit and incorporated into the structures, it is assimilated. However, if the new knowledge is somehow incompatible with prior knowledge, it is transformed into knowledge that the organisation can exploit. It can therefore be argued that, in a turbulent and dynamic business environment, transformation capability is crucial to organisational competitiveness. In the current research, the AC construct is measured using four dimensions, namely knowledge acquisition, assimilation, transformation, and exploitation.

2.7.4 AC and organisational routines in supplier development

From the different definitional perspectives presented so far, a critical aspect of AC is the group of organisational routines through which AC is actualised. In supplier development, organisational routines are exemplified by activities such as on-site visits to initiate improvements at a supplier organisation, training programmes for supplier's employees, personnel exchange with the supplier to build employee capacity in a particular area, and technical assistance (Kim, 1998; Modi and Mabert, 2007). These routines provide a favourable context for tacit KT (Kim, 1998).

Furthermore, the conceptualisation of AC by Zahra and George (2002), as an efficiency ratio, has been criticised because it portrays AC as a set of static resources, and not as an organisational capability or process. Lane, Koka and Pathak (2006) argue that defining AC in terms of efficiency ratios predisposes the construct to a short-term focus and ignores the role of AC in preparing the organisation for exploiting knowledge for future deployment of its dynamic capability. AC is not a static construct measured by proxies, such as the levels of investment in R&D or the number of patents registered, but rather a multi-dimensional construct embedded in the dynamic organisational capability (Flatten, Greve and Brettel, 2011).

2.7.5 AC as a dynamic capability

Capabilities can be conceptualised as high-level routines, or a combination of coordinated organisation processes for deploying resources (Peng, Schroeder and Shah, 2008). Dynamic capability represents a latent organisational ability to renew, augment and adapt its core competencies over time to respond to market changes (Volberda, Foss and Lyles, 2010; Denford, 2013; Duan, Wang and Zhou, 2020). AC, as a dynamic capability, could improve other capabilities that make it easier to apply knowledge in order to achieve organisational objectives (Tarifa-fernández and Cespedes-lorente, 2019).

Dynamic organisational capability is, therefore, the outcome of knowledge integration, and its distinctiveness depends on the extent to which employees have access to, and integration of, specialised knowledge (Grant, 1996). The dynamic capabilities approach to AC enables salient intangible organisational resources, such as tacit KT, to be captured through organisational routines such as supplier development activities (Flatten, Greve and Brettel, 2011; Arroyo-López, Holmen and de Boer, 2012). In contrast to static capabilities, dynamic capabilities are future-oriented and shape organisational resource position, routines and capability (Denford, 2013).

Lane, Koka and Pathak (2006) argue that, from the dynamic capability perspective, AC encompasses three learning processes, which are exploratory learning (knowledge acquisition), transformative learning (knowledge assimilation) and exploitative learning (knowledge exploitation). This argument focuses on the cumulative nature of knowledge in an organisation. It represents the organisational ability to integrate, build, and reconfigure its core competencies to maintain a competitive advantage in a dynamic market. These arguments shed more light on the concept of AC as a dynamic capability or process rather than as a set of static resources in an organisation (Denford, 2013).

The different definitional extensions of the AC discourse provide insights into how the construct has evolved; however, most of them are independent and not integrative. The extensions are not integrated to reconceptualise the AC construct holistically (Lane, Koka and Pathak, 2006). Most of the studies seem to agree over the initial and final stages of AC. However, they do not agree on the intermediate stages of knowledge assimilation alone, or a combination of assimilation and transformation (Knoppen *et al.*, 2011). This research study follows Zahra and George (2002), Flatten *et al.* (2011) and Davila *et al.* (2019), who define AC as a four-dimensional construct comprising of knowledge acquisition, assimilation, transformation, and exploitation.

2.8 Institutional factors in ISD initiatives

Organisational decisions are dependent on various institutional factors, which exert force on them, through relevant institutes such as the government, quasi-government institutions and key stakeholders (Cai, Jun and Yang, 2010). Lewin, Long and Carroll (1999) provide a comprehensive framework of fundamental forces, in an organisational and institutional environment, that can facilitate or attenuate organisational goals such as the role of government, the rule of law, structure of markets, culture and education systems. These factors constrain or support organisational activities (Palthe, 2014) and influence how organisations engage in knowledge acquisition.

For example, ISD initiatives are implemented within the context of SME oriented public procurement policies, and are therefore influenced by a myriad of institutional factors (Patil, 2017; Hawkins, Gravier and Randall, 2018; Flynn, 2018). Institutional factors are inherent in the operating business environment making it difficult or easy to implement the ISD initiatives effectively (Cai, Jun and Yang, 2010; Li *et al.*, 2016). In a study on the implementation of government policy in supply chains, Harland *et al.* (2019) acknowledge some of the institutional challenges that arise due to communication gaps between policymakers, implementers, and the target groups. Harland *et al.* (2019) argue that closing the communication gap between policymakers and implementers could improve the implementation of ISD initiatives.

Moreover, Flynn (2018) emphasises the need to probe beyond government pronouncements to critically ascertain the institutional factors affecting policy implementations regarding SME oriented public procurement policies. There are many institutional factors relevant to the implementation of ISD initiatives, such as regulatory compliance, government support, corruption, monitoring and evaluation systems (Cai, Jun and Yang, 2010; Arráiz, Henríquez and Stucchi, 2013; Kidalov, 2013; Kalyongwe *et al.*, 2018). The institutional factors influencing the implementation of ISD initiatives fall under two categories, namely regulatory compliance, and government support. The following section briefly discusses the institutional factors relevant to this study.

2.8.1 Regulatory compliance

Regulatory compliance involves compliance with the rules, laws, directives and policies of the institutional environment governing a particular sector (Cai, Jun and Yang, 2010; Ibrahim *et al.*, 2017). In the context of public procurement and ISD initiatives, Ibrahim *et al.* (2017) argue that it is critical to comply with procurement laws, and equally essential to ensure that compliance translates into the achievement of procurement objectives. In the Ghanaian context, Ibrahim *et al.* (2017) observe that compliance with procurement legislation is sometimes a façade because it has not been translated into the achievement of value for money.

Furthermore, in their study of non-compliance of EU tendering directives, Gelderman, Ghijsen and Brugman (2006) found that purchaser's familiarity with public procurement rules had a positive, statistically significant impact on compliance. These findings are also echoed by studies in the Ugandan construction industry where Mwelu, Davis and Watundu (2020) argue that familiarity manifested through public buyers' knowledge and skills in applying public procurement regulatory frameworks improves compliance. Similarly, Eyaa and Oluka (2011) report the same findings in their study of causes of non-compliance in public procurement in Uganda.

Notwithstanding the foregoing findings, compliance challenges are attributed to various organisational and institutional constraints. For example, Basheka (2018) argue that sheer clarity in the public procurement regulatory frameworks does not guarantee compliance. Familiarity with public procurement regulatory frameworks allow procuring entities to weigh the benefits of their decisions; it does not always guarantee that they would follow the law (Basheka, 2018). However, regulatory systems form part of the institutional regulatory factors that help organisations adopt best practices (Zhu and Sarkis, 2007). Through regulation and regulatory enforcement, the government help stakeholders in the construction industry implement ISD initiatives. However, the effectiveness of ISD initiatives depends on the robustness of the regulatory system and compliance by the parties involved (Patil, 2017).

Furthermore, in the construction industry in Zambia, Preferential and Reservation schemes are affected by similar institutional factors because they are regulated by the CEEC Act No. 9 of 2006, which is read together with the CEEC (Preferential Procurement) regulations of 2011 (GRZ, 2014). The legislation governing Preferential and Reservation schemes create a transparent regulatory system that guides the implementation of the initiatives (GRZ, 2014; Ministry of Commerce Trade and Industry, 2018). The NCC training is governed by the NCC Act No 9 of 2003, and the 20 per cent subcontracting policy governs the subcontracting of works in the road sector. Legislation and policies are related to the European Code of Best Practices empowering the access

of SMEs to public procurement contracts (EC, 2008), the USA Small Business Act (2010) and the Federal Acquisition Regulation (Kidalov, 2013). The main objective of these pieces of legislation is to facilitate the participation of SMEs in the economy through public procurement (Hawkins, Gravier and Randall, 2018; Flynn, 2018). Therefore, regulatory compliance has a profound influence on the implementation of ISD initiatives.

One area of regulatory compliance that is susceptible to manipulation in the construction industry is fronting. Fronting is a scenario where a foreign company conspires with local citizens, in the registration of the company, to gain undue benefit from citizen targeted empowerment (Warikandwa and Osode, 2017). Fronting is the main challenge facing the implementation of SME oriented public procurement policies in the construction industry, in different countries, because foreign entities end up benefiting from ISD initiatives at the expense of the targeted recipients. This unethical business practice, especially in the construction industry, defeats the objectives of economic empowerment programmes such as ISD initiatives (Emuze and Adlam, 2013).

2.8.1.1 Corruption and unfair competition

Corruption is a subcategory of institutional factors that fall within regulatory compliance to public procurement regulations. Corruption is like a 'multi-faceted prism', with different perceptions depending on the angle of view (Africa Development Bank, 2014). For example, corruption could be viewed from a moral, social, political, or economic point of view, as well as criminal, civil, or administrative law perspective (Africa Development Bank, 2014). However, in order to understand the whole picture of corruption, it is necessary to take a broader view of it. The different meanings of corruption revolve around the abuse of public power for private gain, the violation of the Code of Ethics, and the unlawful advancement of private interests over the interests of one's office or position (Rodriguez, Uhlenbruck and Eden, 2005; Kalyongwe *et al.*, 2018).

Corruption manifests itself in different forms, and the final result is that it undermines the effective implementation of SME oriented public procurement policies, particularly in the construction industry (Kalyongwe *et al.*, 2018). Additionally, corruption induces unfair competition in the procurement system. For example, McKevitt and Davis (2015) argue that in order to facilitate the growth of SMEs, there is a need to level the playing field in which SMEs can compete favourably with large organisations. Transparency and open competition between players are critical.

Shan *et al.* (2015) argue that corruption reduces economic efficiency and growth by distorting markets and the allocation of resources. Corruption also increases the country's reputational risk and undermines public confidence in governance institutions. Corruption is very prominent in the construction industry, particularly in public-funded construction projects (Kalyongwe *et al.*, 2018).

The effect of corruption in the construction industry varies but includes unfair resource allocation, waste of public resources, poor quality project delivery and unfair competition (Shan *et al.,* 2015). Corruption distorts the implementation of ISD initiatives by manipulating the tender processes, thus affecting the effectiveness of ISD initiatives (Kalyongwe *et al.*, 2018).

Corruption is highly perpetuated by government politicians and politically connected individuals, who sometimes exert undue influence on the tendering process to force a particular outcome. For example, Kalyongwe *et al.* (2018), in their study of contextual factors that aid corruption in the procurement cycle of construction projects, revealed that political interference ranks second among the top five contextual factors. The first was low accountability, the third was the failure to blacklist offenders, the fourth was bad governance, and the fifth was limited prosecution and weak regulation. Patil (2017) rightly observes that the implementation of SME oriented public procurement policies depends on the interplay of several political factors and their role in favouring the implementation process. Therefore, because of the critical role of political factors in implementing SME-oriented public procurement policies, ISD initiatives are usually susceptible to corruption, which is exacerbated when the public procurement regulatory regime is weak (Davis and Brady, 2015).

2.8.2 Government support

Government support includes the communication of relevant information to the stakeholders concerned, providing the necessary resources, and other support for the effective implementation of ISD initiatives (Cai, Jun and Yang, 2010). The role of the government is to promote the dissemination and exchange of information on local materials, including their availability and location, as well as to promote the profile of local suppliers to enhance their participation in ISD initiatives (Marion, 2007). Dissemination of information reduces search costs for large organisations that may either not be aware of potential local suppliers, or find it too costly to locate them (Arráiz, Henríquez and Stucchi, 2013). Harland *et al.* (2019) argue that information dissemination is one of the critical institutional support measures designed to inform local contractors about the ISD initiatives and how to access them.

Nevertheless, in their study of implementing government policy in the supply chain using feedback theory, Harland *et al.* (2019) found that governments wasted investments in information and advice mechanisms. They argue that SMEs attach more value to financial support mechanisms than information mechanisms. Therefore, as Loader and Norton (2015) rightly observe, it is essential to tailor any support to the distinct requirements of SMEs in a particular sector.

2.8.2.1 Monitoring and evaluation systems

In addition to information dissemination, another critical element of government support is the monitoring and evaluation system used for tracking ISD initiatives' performance outcomes. The implementation of supplier development initiatives requires systematic monitoring and evaluation systems to ensure that the appropriate tracking of progress and information is readily available to stakeholders (Luzzini, Caniato and Spina, 2014; Cravero, 2018). However, Kidalov (2013) notes that the mere monitoring of the subcontracting efforts of the main contractors cannot align local contractors with government interests. Therefore, strict measures are needed to ensure more significant binding, or alignment, of the interests of main contractors, governments, contracting entities, and public policymakers.

For example, Flynn (2018) argues that it is essential to monitor policy implementation, beyond government pronouncements, to ascertain its effectiveness. Therefore, the impact of the legislation should be monitored through established institutional oversight (Flynn, 2018). Furthermore, Davis and Brady (2015) lament that the lack of robust measurement and monitoring mechanisms adds to SMEs' policy implementation challenges. The monitoring challenges are particularly more prominent in developing countries with relatively weak public procurement regulatory regimes. Therefore, monitoring and evaluation are critical in reconciling policy pronouncements and effective implementation (Cravero, 2018).

2.9 Operational performance in supplier development

The knowledge-based view theory argues that knowledge is a strategic resource that, if adequately leveraged through organisational routines, leads to sustainable competitive performance outcomes (Grant, 1996). In their study of top Italian organisations, Giampaoli, Ciambotti and Bontis (2017) empirically found a positive association between knowledge management, problem-solving and organisational performance. In the context of supplier development, several studies empirically support the effects of supplier development on KT and subsequent supplier performance improvement (Modi and Mabert, 2007; Wagner and Krause, 2009; Rebolledo, Halley and Nagati, 2009; Gosling *et al.*, 2015). For example, Humphreys, Li and Chan (2004) summarise the three critical aspects of supplier development outcomes: supplier performance improvement, buyer competitive advantage, and buyer-supplier relationship improvements. Moreover, Modi and Mabert (2007) assert that supplier development through KT leads to continuous improvement in the supply chain, resulting in performance outcomes such as cost reduction, improved quality, and productivity improvement.

Furthermore, Wagner and Krause (2009) report similar findings from the study on the relationship between KT, from the buyer to the supplier, and supplier performance. Similarly, in their analysis of the effect of basic (e.g. supplier evaluation), moderate (e.g. supplier site visits), and advanced (e.g. training) supplier development, Sánchez-Rodríguez, Hemsworth and Martínez-Lorente (2005) found that supplier development had a significant impact on purchasing performance. Interestingly, however, basic supplier development was found to increase performance more than moderate and advanced supplier development. The results were attributed to the fact that the majority of organisations implemented basic supplier development to a greater extent than moderate and advanced supplier development (Sánchez-Rodríguez *et al.*, 2005).

2.9.1 The performance construct

The performance construct covers several dimensions: operational performance, market performance, financial performance, and many others. Furthermore, supplier development impacts a wide range of organisational activities, including sales, market share, and profit (Terpend et al., 2008); however, the focus of analysis is operational performance in the current study. Operational performance refers to the performance related to the productive and measurable output of an organisation's internal operation, such as productivity, product quality, cost of operations, delivery, flexibility, innovation, and customer satisfaction (Peng, Schroeder and Shah, 2008).

In procurement and supply chain management, for example, operational performance outcomes are related to delivery on time in full (schedule), quality (defect-free), cost (competitive price/low cost), customer satisfaction (number of complaints), flexibility and innovation (Rebolledo, Halley and Nagati, 2009; Saenz, Revilla and Knoppen, 2013). Similarly, Krause, Handfield and Tyler (2007) add cost, quality, delivery time, reliability, flexibility, and service as crucial operational performance outcomes of supplier development. These operational performance indicators are easily measurable and are less ambiguous because they relate to a tangible output.

2.9.2 The supplier performance construct in the construction industry

Specific supplier performance indicators are emphasised in the construction industry in addition to indicators in the manufacturing industry. The activities of the construction industry are project-based. For example, Lawson, Krause and Potter (2015) distinguish between supplier task and project performance outcomes. Task performance outcomes relate to the supplier's creativity and technological performance, while project performance outcomes focus on the project schedule, budget, quality, and technical project objectives. Additionally, health and safety, financial, quality,

design, management, and close-out of the project are key performance indicators in the construction industry (Gosling *et al.,* 2015).

In contrast to other industries where supplier performance evaluation is carried out regularly, supplier performance evaluation is usually undertaken at the end of the project in the construction industry. This approach has attracted some criticisms because it does not feed-forward and lags in terms of performance improvement and, as a result, lessons learned can only be applied to future projects. The current research examines KT in ISD initiatives and subsequently, the operational performance of local contractors in the construction industry. Therefore, supplier performance metrics in the construction industry are critical to understanding the effectiveness of KT. Therefore, the operational performance for the local contractors is derived from supplier development and adapted to the construction industry (Modi and Mabert, 2007; Gosling *et al.,* 2015).

2.9.3 ISD initiatives and operational performance

There is still a paucity of both theoretical and empirical evidence on the effectiveness of ISD initiatives on supplier performance outcomes in SME oriented public procurement policies, because of organisational and regulatory constraints. For example, McKevitt and Davis (2014) studied supplier development in public sector procurement. However, acknowledging the regulatory limitations on formal public buyer-supplier interactions, they concentrated solely on informal supplier development programmes such as coaching and political support. The study investigated how informal supplier development in the public sector affects supplier performance using a mentoring theory. Conversely, Arroyo-López, Holmen and de Boer (2012) found that the public sponsored supplier development programme was only successful with suppliers who possessed sufficient AC and the ability to learn. Similarly, Arráiz, Henríquez and Stucchi (2013) found positive improvements between ISD initiatives and the performance of SMEs in Chile.

However, it is not clear from previous studies, whether this is the case for ISD initiatives in the construction industry. Furthermore, there is also a need for clarity on whether ISD initiatives in the construction industry directly influence operational performance, or whether other variables mediate it. Therefore, the research study theorises that ISD initiatives are associated with KT. In turn, KT is mediated by AC to effectively influence the operational performance of local contractors in the construction industry in Zambia. Equally, the influencing role of institutional factors, namely regulatory compliance, and government support, are explored and empirically investigated.

2.10 Gaps in the existing literature

Previous studies have made significant contributions to understanding the effectiveness of KT and performance outcomes in the supply chain, albeit from the private sector and manufacturing industry perspective (Modi and Mabert, 2007; Wagner, 2010; Chen, Ellis and Holsapple, 2018). However, research into the association of ISD initiatives with KT and the subsequent operational performance improvement in the construction industry is sparse. Therefore, it remains unclear whether ISD initiatives lead to KT and subsequently to operational performance improvement in the construction industry. Addressing this gap will contribute to a better understanding of which ISD initiatives are significantly associated with KT and examine the effect of KT on the operational performance of local contractors.

Lane, Koka and Pathak (2006) recommend extending the empirical studies on AC beyond strategic alliances and R&D contexts into the supply chain. For example, Azadegan (2011) contributes to the AC discourse in the buyer-supplier relationship by empirically demonstrating that AC improves the operational innovation of the supplier more with intensive tasks than less intensive tasks. Arroyo-López, Holmen and de Boer (2012) also emphasise that supplier development activities such as training may lead to performance improvement of the supplier, provided the supplier has sufficient AC.

Saenz, Revilla and Knoppen (2013) add to the discussion by evaluating the mediating role of AC on organisational compatibility, and performance within the buyer-supplier relationship, having found that AC significantly mediated the relationship between organisational compatibility and innovation under demand uncertainty. Additionally, Duan, Wang and Zhou (2020) found that the different dimensions of potential and realised AC had different mediating effects on innovation in high-tech manufacturing companies in China. Finally, in the context of the information technology project-based organisational setting, Ali, Musawir and Ali (2018) empirically demonstrated that knowledge sharing does not directly impact organisational performance but improves AC, leading to organisational performance. The argument advanced by most studies is that KT increases the AC levels of the recipient organisation and subsequently performance improvement (Lane, Koka and Pathak, 2006; Wuryaningrat, 2017; Zhang, Zhao and Lyles, 2018).

The current research extends the discussion of AC within ISD initiatives and theorises that AC mediates the relationship between KT and operational performance. Additionally, the study focuses on the ISD initiatives in the construction industry, which has been described as an industry with weak AC levels because of the transient nature of organisations in the industry, which is project-based, tailored to unique customer needs, and based on temporary collaborations (Manley, Rose and

Lewis, 2014; Lawrence, Chan, and James, 2016; Ali, Musawir and Ali, 2018). Furthermore, there is limited knowledge of how the dimensions of AC individually, and jointly, influence the KT and operational performance of local contractors in the construction industry in a developing country context such as Zambia. These gaps have received relatively little attention in previous research, and further research is needed to understand the influence of AC in KT and operational performance.

It is also evident from previous studies that supplier development leads to KT. Yet, previous research shows that such collaborations alone may not be sufficient to ensure a successful KT (Squire, Cousins and Brown, 2009). The argument is that other mechanisms are also crucial to the process. The research study theorises that institutional factors, such as regulatory compliance and government support, influence KT from ISD initiatives because they are implemented through SME, oriented public procurement policies (Nakabayashi, 2013; Patil, 2017). However, it is not clear from existing literature on how institutional factors, such as regulatory compliance and government support, influence KT in ISD initiatives. Therefore, the current study seeks to contribute to the debate by first exploring the main institutional factors that influence the implementation of ISD initiatives in the construction industry in Zambia, using a qualitative study. And secondly, to investigate how institutional factors, such as regulatory compliance and government support, moderate the relationship between ISD initiatives and KT using a quantitative study.

2.11 Chapter summary

Firstly, the chapter has unpacked the different types of supplier development, such as supplier training, supplier evaluation, information sharing, direct incentives, supplier certification, competitive pressure, supplier involvement in new product development, and recent knowledge management as a supplier development activity. Second, it is evident from the literature that significant research into supplier development has been concentrated in the private sector, with a dearth of research in the public sector. The literature also distinguishes the different approaches to supplier development between the private and public sectors. The point of departure here is that, while supplier development is strategically driven in the private sector through supplier base rationalisation and supplier evaluations, in contrast, the main driver of ISD initiatives are socio-economic development objectives.

Furthermore, supplier development can also be viewed from the level of involvement of the buying organisation, commonly referred to as indirect and direct supplier development. Indirect supplier development involves little resource commitment by the buying organisation. In contrast, direct supplier development encompasses close interactions, and relation-specific investments involving the dedication of human and capital resources to the supplier. The current study considers

both indirect (Construction Finance Initiative, Preferential, and Reservation schemes) and direct (i.e. the 20 per cent subcontracting policy and NCC training) ISD initiatives. However, the implications on KT of the indirect and direct ISD initiatives remain unclear.

Thirdly, the study also underlines the importance of KT in supplier development as a panacea for operational performance improvement. Building on a knowledge-based view, the literature argues that knowledge is a valuable strategic resource that can be leveraged for the competitive advantage of an organisation. However, there is little evidence of how KT from ISD initiatives can influence performance improvement. Moreover, the current research theorises that AC mediates the relationship between KT and operational performance. Furthermore, the study theorises that, institutional factors, such as regulatory compliance and government support, moderate the relationship between ISD initiatives and KT.

Fourthly, literature shows that while the performance of suppliers varies from one programme to another, the operational performance of suppliers converges on quality, delivery, cost reduction and service. Other measures, such as health and safety, project design and close-out, are incorporated in the construction industry as key performance indicators. Therefore, taking into account the above findings, and the scarcity of studies within the ISD initiatives in the construction industry, the research study will contribute to the understanding of how and which ISD initiatives are associated with KT and subsequently the operational performance of local contractors in the construction industry in Zambia.

The following chapter presents the contextualised connection between public procurement policy and ISD initiatives to clarify which ISD initiatives support local contractors. The chapter begins with an overview of the role of public procurement in socio-economic development. The chapter then links both primary and secondary objectives of public procurement with ISD initiatives that fall within the secondary (‘horizontal’ or ‘collateral’) procurement objectives.

CHAPTER 3

PUBLIC PROCUREMENT POLICY AND ISD INITIATIVES

3.1 Introduction

The existing literature on supplier development, and in particular, ISD initiatives, has been comprehensively reviewed in the previous chapter. The chapter also explored the associations between KT, AC, institutional factors, and operational performance. Chapter 3 extends the literature review from the previous chapter to a more contextualised setting of public procurement policy and ISD initiatives to provide a nuanced understanding of the public procurement policy implications on socio-economic development.

The current chapter is organised as follows. Section 3.2 outlines an overview of public procurement policy, followed by section 3.3, which presents the role of public procurement in economic development. Section 3.4 discusses the challenges of implementing public procurement policy as a tool for socio-economic development followed by ISD initiatives in the Zambian construction industry and gaps in the implementation of ISD initiatives in sections 3.5 and 3.6, respectively. The chapter concludes with a summary in section 3.7.

3.2 Overview of public procurement policy

Literature is inundated with evidence that public procurement is a policy-driven process right from planning, needs assessment, supplier selection, contract award, and execution (Oluka *et al.*, 2020). The policy is a bedrock of the entire public procurement process, including engaging key stakeholders such as SMEs in public procurement (Asamoah, Annan and Rockson, 2019; Oluka, Okoche and Mugurusi, 2020). For example, public procurement policy can be used to achieve multiple objectives such as environmental sustainability, economic growth, and empowerment of disadvantaged minority populations (Mccrudden, 2004; Basheka, 2018).

Public procurement policy is an essential driver of socio-economic development internationally and a lever for securing a more comprehensive economic inclusion (World Bank, 2017; Woldesenbet and Worthington, 2019). As a monetary instrument for socio-economic development, public procurement policy, when carefully arranged and executed, can offer a variety of advantages, such as political, economic, and social benefits, and create a vibrant private sector through linkages (OECD, 2017). Public procurement constitutes a significant expenditure and provides the largest market for SMEs in both developed and developing countries (Loader, 2017), which, when correctly leveraged, can significantly drive economic growth. The critical role of public

procurement as a policy tool is evidenced by several SME oriented public procurement policies in different jurisdictions (Patil, 2017; Hawkins, Gravier and Randall, 2018).

SME oriented public procurement policies in both developed and developing countries is a direct response to addressing the underrepresentation of SMEs in public procurement (Flynn, 2018). For example, in the study of public procurement policy in India, Patil (2017) acknowledges that SME oriented public procurement policies have attracted considerable government support. Similar studies have reported similar findings in the UK (Loader, 2017) and the USA (Hawkins *et al.*, 2018).

However, the implementation of public procurement policies, particularly in developing countries, is often affected by organisational and institutional challenges (Patil, 2017). One such challenge is the weak public procurement regulatory regime. Ibrahim *et al.* (2017) argue that compliance with public procurement legislation has been a challenge in most developing countries, which in turn affects the achievement of procurement objectives. For example, Basheka (2018) recommends an effective procurement policy and legal frameworks as a critical precursor for effective implementation of public procurement policies such as engaging women-owned businesses in public procurement.

In a review of SME oriented public procurement policy adopted by the UK coalition government between 2010 to 2015, Loader (2017) argues that the government and its quasi-institutions made significant progress in improving SME participation in public procurement. However, the study acknowledges the need for better ways of measuring the effectiveness of the interventions and improving awareness of the public procurement initiatives for SMEs. Loader and Norton (2015) add that the effectiveness of SME oriented public procurement policy requires understanding the needs of SMEs in order to consider each sector's distinctiveness, unlike the current blanket approach.

Public procurement expenditure is estimated to be 12 per cent of the GDP for developed countries and about 20 per cent for developing countries (Krasnokutskaya and Seim, 2011; OECD, 2017; Hawkins, Gravier and Randall, 2018; Asamoah, Annan and Rockson, 2019). The significant expenditure on public procurement has resulted in it being subjected to policies and regulations to ensure that goods, works, and services are acquired at competitive prices and in a transparent manner to achieve value for money (Arlbjørn and Freytag, 2012). Furthermore, public entities are not only large procurers in an economy but also use public funds. Therefore, public procurement policies must promote fairness and ensure that public procurement is non-discriminatory to economic players such as SMEs (Asamoah, Annan and Rockson, 2019).

In the context of this research study, the government of the Republic of Zambia has committed over $8 billion in the procurement of various infrastructure projects, and one of the main objectives is to improve the capacity of local contractors through SME oriented public procurement policies (GRZ, 2014; Road Development Agency, 2016; Cheelo and Liebenthal, 2020). These policies are not unique to Zambia alone; the USA federal government spends billions on SME oriented public procurement of infrastructure projects (Marion, 2007). Similar policies have been implemented in Japan (Nakabayashi, 2013), Europe (Kidalov, 2013), China, Africa and Brazil (Grandia and Meehan, 2017; Oluka, Okoche and Mugurusi, 2020). The main objective of government-supported SME oriented public procurement policies, particularly in the construction industry, is to integrate SMEs into the economy and ensure that they are competitive.

3.3 Role of public procurement in economic development

Broadly, public procurement is designed to achieve primary and secondary objectives. For example, primary objectives focus on procuring goods, services and works transparently and competitively in line with the public procurement regulatory frameworks (Ibrahim *et al.*, 2017; Basheka, 2018). The objectives are enshrined in public procurement regulatory frameworks as critical aspects of fiscal policies for achieving effective and efficient public financial management (Asamoah *et al.*, 2019). Furthermore, the primary objectives of public procurement are to provide supplies, services, works, or disposal of assets in a transparent, fair, and competitive manner using best practices (World Bank, 2017). Internationally accepted primary objectives of public procurement are based on the United Nations Commission for International Trade Law model on procurement of goods, works and services (UNICITRAL). These include maximising economy and efficiency, fostering participation by all eligible suppliers, promoting competition, and integrity (UNICITRAL, 1995; 2014; Watermeyer, 2003; Becker *et al.*, 2018; Ankersmit, 2020).

In contract, secondary or collateral (political) objectives of public procurement focus on broad strategic policy objectives such as supporting SMEs, sustainable public procurement, youths and women-owned enterprises (Mccrudden, 2004; (Preuss, 2009) Loader and Norton, 2015; Loader, 2017; Basheka, 2018; Hawkins, Gravier and Randall, 2018; Cravero, 2018; OECD, 2019). Basheka (2018) argues that governments use public procurement as a tool for socio-economic development such as supporting women business by addressing barriers and increasing opportunities.

Furthermore, significant parallel developments are using public procurement policies and regulations to achieve secondary objectives (Mccrudden, 2004; Oluka, Okoche and Mugurusi, 2020). Harland *et al.* (2019) argue that the size of government procurement and its spending power is vital for SME development through a variety of ISD initiatives. In this regard, the majority of governments

are increasing support to SMEs through ISD initiatives such as Preferential and Reservation schemes, financial support, subcontracting, and training (Marion, 2007; Nakabayashi, 2013). Watermeyer (2003) outlines how Preferential and Reservation schemes are used as policy instruments to support socio-economic objectives in the construction industry by setting aside specific contracts for targeted citizens.

For example, specific contractors who meet the prescribed criteria are granted tender evaluation points for the implementation of the Preferential procurement scheme (Ssennoga, 2006). Krasnokutskaya and Seim (2011) add that one of the most commonly used preference mechanisms is the bid discount on a financial evaluation to improve the bids of the preferred organisations by a pre-established rate when determining the winner, but using the actual amount of the winner's bid in the contract. These mechanisms are designed to enhance the participation of the prescribed organisation in the economic activities of the country. Furthermore, Ssennoga (2006) argues that Preferential and Reservation schemes are examples of discrimination in public procurement used by governments to support their domestic industry to enhance socio-economic development goals beyond the immediate primary procurement objectives. In the long run, protectionism contributes to SME growth and economic development. Arrowsmith (2010) and Watermeyer (2003) argue that as a policy instrument for socio-economic development, public procurement is used to:

1. Stimulate and promote economic activities,
2. Protect particular industries against foreign competition,
3. Improve the competitiveness of specific industries,
4. Reduce regional economic disparities,
5. Achieve specific social objectives such as job creation, fair employment conditions, support marginalised groupings, encourage equality in the participation of economic activities, support local content, and sustainability practices.

Furthermore, Watermeyer (2003) outlines the generic methods where public procurement is used as a policy instrument for supporting socio-economic objectives in the construction industry. Table 3-1 summarises the generic schemes for using procurement for socio-economic development in the construction industry. These include Preferential and Reservation schemes, indirect procurement, and supply-side measures for targeted citizen companies.

Table 3-1: Generic scheme for using procurement for socio-economic development

Scheme type	Description
Reservations	Contracts or portions thereof are reserved for contractors who qualify in specific prescribed criteria, for example, contractors who: • Are owned, managed, and controlled by a target population group • Are classified as being a small business enterprise • Have equity ownership by companies with prescribed characteristics or, • Are joint ventures between non-targeted and targeted joint ventures
Preferencing	Although all contractors who are qualified to undertake the contract are eligible to tender, tender evaluation points are granted to those contractors who satisfy prescribed criteria or who undertake to attain specific goals in the performance of the contract.
Indirect	Procurement strategies and requirements are used to promote policy objectives by constraining how the procurement is delivered or being used to generate offsets in parallel to the procurement. For example, specifications require that work associated with the contract is undertaken in a manner that supports policy objectives or offsets whereby undertakings such as the provision of bursaries, participation in an economy, the provisions of community centres, that are unrelated to the procurement itself are, in order to secure the contract, committed to.
Supply-side	Supply-side measures are provided to targeted enterprises to overcome barriers to competing for tenders or for participating in procurement within the supply chain, for example, bridging finance and securities requirements, mentorship, and capacitation workshops.

Source: Adopted from Watermeyer (2003, p. 12)

3.4 Challenges in implementing a public procurement policy

Public procurement policy as an instrument for socio-economic development is not devoid of challenges. For example, despite massive investment in SME orient public procurement policy implementation, the benefits to intended recipients are usually not clear (Hawkins *et al.*, 2018). Moreover, there is a possibility that the policy may run counter to other primary procurement objectives, such as competition, quality, and economy (Watermeyer, 2003). For instance, Patil (2017) argues that even though SME oriented public procurement policies have significant advantages, the different procurement objectives may create a conformance-performance tension, which makes policy implementation difficult. Additionally, Quinot (2013) argues that concurrent goals generate friction within the regulatory system; this is because different rules aimed at achieving different objectives create conflict with one another. For example, supporting SME procurement may create tension with environmental sustainability where SMEs may not have robust systems to source environmentally friendly inputs.

Furthermore, Ssennoga (2006) argues that public procurement policies based on protectionism reduce competition, leading to a loss of efficiency in the procurement process. Competition in procurement encourages suppliers to improve the quality of their products and services through competitive pressure. When suppliers compete to win business, they tend to improve their offerings to beat their competitors (Modi and Mabert, 2007). Besides, the favouritism of local

suppliers also constitutes non-tariff barriers in international trade, which may be detrimental to the economy in the global village (Arrowsmith, 2010). Procurement policies supporting socio-economic development must be weighed against the cost involved in implementing them, such as monitoring and compliance with administrative requirements (Arrowsmith, 2010).

3.5 ISD initiatives in the Zambian construction industry

Established on public procurement policy as outlined in the above discussions, Zambia has implemented several ISD initiatives as a means of capacity building of local contractors. These include Preferential and Reservation schemes, training of local contractors by the NCC, the 20 per cent subcontracting policy for road construction projects. The 20 per cent subcontracting policy and Construction Finance Initiative (GRZ, 2014; Road Development Agency, 2016; National Council for Construction, 2017; Ministry of Commerce Trade and Industry, 2018; Cheelo and Liebenthal, 2018; Cheelo and Liebenthal, 2020). These government-sponsored initiatives aim to encourage local contractors to break into the road construction industry in Zambia. The construction industry market share has been dominated by foreign companies (over 80 per cent) that have demonstrated both financial and human capacity and local contractors (National Council for Construction, 2017; Ministry of Commerce Trade and Industry, 2018; Cheelo and Liebenthal, 2018). The following sections discuss the above initiatives in detail.

3.5.1 CEEC-Preferential and Reservation schemes

The CEEC Act No 9 was enacted in May 2006 with the mandate to create opportunities for citizens empowered, influenced, and owned companies to access government contracts. Furthermore, the CEEC supports targeted citizen-owned enterprises to raise them to participate effectively in the national economy through entrepreneurship (Ministry of Commerce Trade and Industry, 2018). The CEEC promotes equal access to economic resources and employment by removing structural and discriminatory constraints and investments in greenfield (Ministry of Commerce Trade and Industry, 2018).

In order to archive the above objectives, the CEEC, through Preferential procurement regulations, statutory instrument number 36 of 2011, and circular number 3 of 2013, guides on the thresholds of eligible bidders for the national and international competitive bidding. The CEEC regulations guide the implementation of Preferential schemes through public procurement contracts, as summarised in Table 3-2.

Table 3-2 Definitions of citizen-owned empowered and influenced companies

Company	Equity owned by citizens	Bid price adjustment
Citizen owned company	*At least 50.1 per cent	12 per cent
Citizen empowerment company	25-50 per cent	8 per cent
Citizen influenced company	5-25 per cent	4 per cent
Domestically manufactured goods by any of the above categories of companies		15per cent

* Citizens have significant control of the management of the company

Source: CEEC Act No 9 of 2006

Moreover, Public Procurement Regulations (2011) section 159, parts 1 and 2, provide for a "preference scheme for citizen bidders or local suppliers is aimed at developing businesses owned by citizens or local suppliers." The Preferential scheme gives locally targeted businesses some competitive advantage by subtracting a specified margin, to the evaluated bid price of bidders who are eligible for the preference scheme during the financial evaluation of bids as indicated in Table 3-2 above.

Additionally, section 160 part 1 and 2 further indicates that "the procurement of goods, works or services may be subject to a Reservation scheme, consistent with the government's economic and social policy as provided under the Act." The objective of the Reservation scheme is to develop businesses influenced, empowered, or owned by a citizen by reserving specific public procurement contracts, as summarised in Table 3-3.

Table 3-3 Reservation thresholds

Nature of public procurement	Reserved contract value (K)
Goods	≤ 3,000,000
Building construction	≤ 20,000,000
Civil and road works	≤ 30,000,000
Non-consulting services	≤ 1,000,000

Note that the exchange rate is approximate: $1≅ K18 (2020)

Source: CEEC Act No 9 of 2006

3.5.2 NCC training programme

The NCC is a statutory body set up under the NCC Act No. 13 of 2003. The mandate of NCC is to monitor and regulate all construction activities in Zambia. Regulations are enforced by registering contractors participating in public infrastructure development projects (National Council for Construction, 2017). The functions of NCC, as set out in the NCC Act No. 13 of 2003 that mainly related to ISD initiatives, which include training of persons engaged in construction or activities related to construction under the NCC construction school.

Through its construction school, the NCC engages in the training and development of individuals and companies involved in construction (National Council for Construction, 2017). Furthermore, the council has the mandate to promote the participation of the local contractors in the construction industry. However, in terms of punitive measures of erring contractors, the mandate is limited to publicly funded projects only (GRZ, 2014). Hence, the NCC training programme is a critical ISD initiative designed to develop skills and stimulate KT to local contractors through training, particularly for public-funded construction projects.

There are several categories of contractors under NCC regulation; however, for the current study, only four (4) categories were considered (B, C, R, and ME), which form the core activities of construction as shown in Table 3-4. These include general building and housing (B), general civil engineering (C), general roads and earthworks (R), and Mechanical Engineering works (ME). The NCC registers contractors into a six-tier grading system (grades 1, 2, 3, 4, 5, and 6). The grade of the contractor represents the level of competence in terms of contract value limitations and technical capacity (Cheelo and Liebenthal, 2020). Grade 1 is the highest, while Grade 6 is the lowest. In this research, only Grade 3 to Grade 6 contractors formed part of the study. GRZ (2014) indicates that registration of foreign contractors is restricted to grades 1 and 2 only. Therefore, grades 3 to 6 comprise local contractors, most of whom lack experience, financial resources, and equipment; hence can only access contracts up to a specific limit, as indicated in Table 3-4.

According to the NCC classification system, high-value road construction projects are usually limited to grade 1 to 2 contractors. For example, the NCC contractor registration as of 5th February 2019 indicated that less than 20 per cent of all the local contractors fall in grades 1 and 2. Cheelo and Liebenthal (2020) corroborate the information on the register and reiterate that over 80 per cent of local contractors are registered in grades 3 to 6; nevertheless, they command less than 5 per cent of the market share in the construction industry. Lack of capacity by most local contractors is the main contributing factor for failure to execute high-value projects.

Therefore, SME oriented public procurement policies through ISD initiatives are part of the strategies designed to upgrade the local contractors. Nevertheless, the effectiveness of ISD initiatives in terms of KT and operational performance improvement remains unclear. Table 3-4 summarises the classification of contractor grades and contract value limitations.

Table 3-4 Limitation on contract value by contractors in various grades and categories

Classification Grade	1	2	3	4	5	6
Category B-General Building and Housing	>K55m	>K25m-K55m	>K13m-K25m	>K9m-K13m	>K4m-K9m	>K0.0m-K4.0m
Category C-General Civil Engineering Works	>K60m	>K30-K60m	>K20m-K30m	>K13m-K20m	>K4-K13m	>K0.0m-K4.0m
Category R-General Roads and Earth Works	>K150m	>K60m-K150m	>K30m-K60m	>K20m-K30m	>K6m-K20m	>K0.0m-K6.0m
Mining Services	>K150m	>K35m-K150m	>K20m-K35m	>K13m-K20m	>K4m-K13m	>K0.0m-K4.0m
Category E-General Electrical and Telecommunication	>K150m	>K40m-K150m	>K20m-K40m	>K13m-K20m	>K6m-K13m	>K0.0m-K6.0m
Category ME-Mechanical Engineering Works	>K150m	>K40m-K150m	>K20m-K40m	>K13m-K20m	>K6m-K13m	>K0.0m-K6.0m

Note that the exchange rate is approximate: $1≅ K18 (2020)

Source NCC (2019)

A brief explanation of Table 3-4 shows that a contractor in grade 1 category B-general building and housing may access more than a K55 million contract value. In contrast, Grade 6 in the same category can access a maximum of the contract value of K4 million. Moreover, grade 1 category C-general civil engineering can access a minimum of K60 million compared to a grade 6 contractor who can access a maximum of K4 million. Additionally, grade 1 in category R-general civil and engineering works can access more than K150 million of the contract value. In comparison, grade 6 in the same category can only access a maximum of K6 million. Similar thresholds apply to category ME-general mechanical engineering works with grade 1 accessing more than K150 million compared to a maximum of K6 million for a grade 6.

3.5.3 The 20 per cent subcontracting policy

The government of the Republic of Zambia introduced a 20 per cent subcontracting policy on all road contracts in 2013 through the RDA (Phiri, 2016), as part of the response in closing the capacity gap between foreign and local contractors. The 20 per cent subcontracting policy entails that all road contracts awarded by the central, quasi, and local governments exceeding K30 million should be executed by local contractors (Road Development Agency, 2016). The specific objectives of the 20 per cent subcontracting policy are to encourage local contractors; create employment for Zambian

citizens; develop viable local contracting capacity and elevate local contractors from Grade 6 to Grade 1.

There are two methods of subcontracting that RDA has devised; these are domestic and nominated subcontracting, depending on the nature, complexity, urgency, and value of the contract (Road Development Agency, 2016). Domestic subcontracting is an approach where the main contractor(s) select the subcontractor(s) registered with NCC in the appropriate grades, subject to approval by RDA. Contrariwise, in the nominated subcontracting, RDA proposes a list of subcontractors from which the main contractor can get quotations and sign an agreement, which subsequently results in the formation of a contract between the main contractor and the subcontractor (Road Development Agency, 2016). However, these approaches must be in tandem with the Preferential and Reservation schemes under the CEEC Act No. 9 of 2006 and apply to local contractors whose registered place of business is in the same district/province as the location of the project site.

Despite the 20 per cent subcontracting policy being in place for over eight years now, there has been limited empirical research on how the policy has contributed to contractor capacity development and performance improvement (GRZ, 2014). One cited challenge has been implementing the policy, which has been described as a 'mere pronouncement' without a legal framework (Cheelo and Liebenthal, 2018). The main contractors and clients implement the policy out of discretion without an established legal framework (Phiri, 2016). Furthermore, the 20 per cent subcontracting policy is restricted to road projects only and does not include other sectors such as the energy and housing projects. The restriction to road projects only inadvertently limits the scope of the policy and its overall impact on local contractor capacity building. Therefore, the current research is motivated to empirically examine the effect of the 20 per cent subcontracting policy on KT and, subsequently, local contractor operational performance.

3.5.4 Construction Finance Initiative

The Construction Finance Initiative is another ISD initiative implemented in line with the 20 per cent subcontracting policy in the construction industry by RDA and NRFA (Road Development Agency, 2016). The Construction Finance Initiative responds to financial challenges facing local contractors in the construction industry and the need to build contractor capacity. To actualise the Construction Finance Initiative, the government signed a memorandum of understanding with commercial banks, insurance companies, and equipment suppliers to facilitate access to finance by local contractors (GRZ, 2014). The government sponsored ISD initiatives aim to enable local contractors to enter the construction industry market in Zambia. The Construction Finance Initiative

objective is to develop supplier capacity by offering convenient access to finance for local contractors (Road Development Agency, 2016). However, the effectiveness of the initiative also remains unclear because of the lack of empirical studies to ascertain its effect on KT and the operational performance improvement of local contractors.

3.6 Gaps in the implementation of ISD initiatives

Limited studies on the implementation of ISD initiatives have produced mixed findings (Patil, 2017; Loader, 2017; Hawkins, Gravier and Randall, 2018). First, there is limited empirical evidence on the implementation of ISD initiatives, especially from the beneficiary perspective, making it challenging to justify their effectiveness. Watermeyer (2003) argues that although ISD initiatives are well documented, there is little evidence of their implementation and the benefits to the beneficiaries in the literature. For example, in South Africa, Dapaah, Thwala and Musonda (2016) acknowledge in their evaluation of contractor development programmes that the programmes exhibited some gaps in their implementation that needed addressing if the programme is to be entirely successful.

Another challenge with the effectiveness of ISD initiatives is the ability to measure, quantify, and monitor compliance on the implementation of ISD initiatives (Mccrudden, 2004). Furthermore, Davis and Brady (2015) argue that the lack of robust measurement and monitoring mechanisms have contributed to implementation policy challenges and, therefore, makes it difficult to quantify the effectiveness of ISD initiatives. Loader (2017) recommends tracking SME oriented public procurement policies consistently and comprehensively monitoring and measuring outcomes.

A Parliamentary committee on Communication, Transport, Works, and Supply notes that there is limited research in the Zambian construction industry focusing on implementing ISD initiatives to encourage local contractor participation (GRZ, 2014). Cheelo and Liebenthal (2020) argue that the massive infrastructure development in Zambia is driven by political and economic factors, which necessitate the need to measure the efficiency of investment to inform policymakers. Limited research in the construction industry has constrained policy intervention in the industry. There is empirical uncertainty about the extent to which ISD initiatives are associated with KT and, subsequently, the operational performance of local contractors. Therefore, the current study contributes to the existing literature by examining the effectiveness of KT in ISD initiatives and the operational performance of local contractors in the construction industry in Zambia.

3.7 Chapter summary

The chapter has reiterated that public procurement is a tool for socio-economic development. The chapter has discussed the role of public procurement policy in socio-economic development in

general and the role of ISD initiatives in particular. The challenges and gaps in implementing public procurement policies and ISD initiatives have been outlined in the chapter. Furthermore, predicated on public procurement policy as outlined in the above examples, Zambia has implemented some ISD initiatives as a means of capacity building of local contractors. These are Preferential and Reservation schemes, the 20 per cent subcontracting policy, NCC training of local contractors, and the Construction Finance Initiative. These government-supported SME oriented public procurement initiatives aim to encourage local contractors to break into the construction industry in Zambia. Nevertheless, limited research poses a challenge in informing policymakers on the effectiveness of ISD initiatives in the current form.

The following chapter outlines the theoretical and conceptual framework of the research study. Three main theories guide the chapter: the knowledge-based view, AC, and institutional theories, to address the research questions. Furthermore, the chapter discusses hypotheses development in this research study and explains the relationships between the variables in the conceptual framework.

CHAPTER 4

THEORETICAL AND CONCEPTUAL FRAMEWORK

4.1 Introduction

The current chapter outlines the theories that underpinned the study and the conceptual framework. The chapter is organised as follows: Section 4.2 outlines the three theories used in the study, namely the knowledge-based view, AC, and institutional theories, and how they are connected to the research questions. Next, section 4.3 presents a conceptual framework that hypothesises the relationships among variables. Section 4.4 discusses the hypotheses development, followed by the control variables relevant to the research study and the chapter summary in sections 4.5 and 4.6, respectively.

4.2 Theoretical framework

In order to address the research questions in Table 4-1, the current research adopted the knowledge-based view theory, which was supplemented by the AC and institutional theories. The knowledge-based view and AC theories are widely used in supplier development literature (Modi and Mabert, 2007; Nagati and Rebolledo, 2012; Saenz, Revilla and Knoppen, 2013). The institutional theory has been very prominent in recent years in sustainable supply chain management despite relatively low publications focusing on supplier development. However, there has been heightened calls for extending the theory in different operations and supply chain management (Kauppi, 2013). This study, therefore, contributes to the calls by exploring and investigating how institutional factors influence KT in ISD initiatives (Kauppi, 2013; Cai, Jun and Yang, 2010; Kalyongwe *et al.*, 2018).

Table 4-1 Summary of research questions and theoretical framework

Research question	**Theoretical lens**
RQ1: What are the main institutional factors influencing the implementation of ISD initiatives?	-
RQ2: Which ISD initiatives are associated with KT?	Knowledge-based view theory
RQ3: To what extent does KT affect operational performance?	Knowledge-based view theory
RQ4: Does AC mediate the relationship between KT and operational performance?	Knowledge-based view theory supplemented by AC theory
RQ5: Do institutional factors moderate the relationship between ISD initiatives and KT?	Knowledge-based view theory supplemented by the institutional theory

Source: Researcher (2020)

4.2.1 Knowledge-based view theory

The knowledge-based view theory conceptualises an organisation as an institution of knowledge-creating, storing, and integrating individuals and groups (Grant, 1996). The primary

assumption of the knowledge-based view is that organisational resources and capability advantages are derived from superior access to and integration of specialised knowledge from the internal or external environment (Denford, 2013). In this context, knowledge is a critical resource that resides in specialised individuals, which an organisation can leverage for value creation (Modi and Mabert, 2007).

Wagner (2010) argues that knowledge sharing can occur from internal sources to the supplier organisation or from the buying organisation in supplier development programmes. However, Volberda, Foss and Lyles (2010) argue that irrespective of the source of knowledge, the critical aspect is how to absorb the knowledge into the organisation system. A critical process of absorbing external knowledge is through supplier development, which facilitates interaction between the buyer and supplier and subsequently leads to KT (Modi and Mabert, 2007; Chen, Ellis and Holsapple, 2015; Chen, Ellis and Holsapple, 2018).

The research work theorises that organisational routines such as individual and group interactions facilitated by supplier development activities stimulate KT (Modi and Mabert, 2007). In line with the current study, ISD initiatives such as the 20 per cent subcontracting policy, Preferential and Reservation schemes, NCC training, and Construction Finance Initiative represent organisational routines that facilitate interaction and stimulate KT from ISD initiatives. ISD initiatives theoretically represent supplier development activities. These include education and training, on-site problem solving to increase supplier awareness of the projects, supplier evaluations, set-asides, bid preferences, technical staff exchanges and subcontracting in procurement and supply chain literature (Marion, 2007; Kidalov, 2013; Chen, Ellis and Holsapple, 2015). These activities facilitate different levels of interactions and stimulate KT from the buying organisation with more established knowledge management systems to SME supplier organisations with less developed knowledge management systems (Wagner, 2010; Arroyo-López, Holmen and de Boer, 2012).

Therefore, the knowledge-based view theory is relevant in examining the association of ISD initiatives with KT and the operational performance of local contractors in the construction industry in Zambia. The knowledge-based view theory places an organisation as a focal point for knowledge creation, coordination, integration, and application for commercial value (Nagati and Rebolledo, 2012). In the current research, the knowledge-based view theory is adopted to address RQ2 and RQ3. More specifically, *which ISD initiatives are associated with KT and the effect of KT on operational performance?*

4.2.2 The AC theory

There is a great deal of emphasis on the importance of AC in supplier development for effective KT. For example, Arroyo-López, Holmen and de Boer (2012) argue that supplier development can only lead to supplier performance improvement when a supplier possesses sufficient AC. In the current study, Zahra and George (2002), Flatten *et al.* (2011), and Davila *et al.* (2019) guide the conceptual development of the AC as a multidimensional construct. Anchored on AC theory, AC is a fundamental learning process used by an organisation to acquire, assimilate, transform, and apply knowledge for performance improvement (Zahra and George, 2002; Lane, Koka and Pathak, 2006).

It is now vital to link ISD initiatives and KT to AC. Ideally, ISD initiatives are knowledge-generating activities through buyer-supplier interactions. When the knowledge is generated, transmitted, and shared, AC improves the productivity of KT (Volberda *et al.*, 2010) for performance improvement. The research study posits that AC has an effect on the operational performance of local contractors only when the external knowledge flows from ISD initiatives is effectively acquired, assimilated, transformed, and after that applied for operational performance improvement. Put differently, the study theorises that AC mediates the relationship between KT and the operational performance of local contractors. There is empirical evidence that knowledge sharing improves AC, which in turn leads to innovation as a result of the knowledge gained (Liao, Fei and Chen, 2007; Escribano, Fosfuri and Tribó, 2009; Duan, Wang and Zhou, 2020; Ali, Musawir and Ali, 2018). Saenz, Revilla and Knoppen (2013) argue that the buyer-supplier relationship is competitive when organisational compatibility is translated into AC, and subsequently, AC leads to improved sustainable performance improvement. Similarly, Arráiz, Henríquez and Stucchi (2013), in the study of supplier development and organisational performance between large organisations and SMEs, recognise that the most critical factor shaping the linkages between large organisations and SME suppliers is AC of local SMEs.

Therefore, theoretical support for the contention that KT within supplier development positively influences supplier performance through AC is well-founded (Blome *et al.*, 2014). In this context, knowledge represents a valuable resource that leads to improved AC and, subsequently, supplier performance improvement (Wuryaningrat, 2017; Balle *et al.*, 2020). In this research, the AC theory and the knowledge-based view are adopted to answer RQ3. More specifically, *does AC mediate the relationship between KT and operational performance?*

4.2.3 Institutional theory

The institutional theory argues that the institutional context in which an organisation operates influences its practices and strategies (DiMaggio and Powell, 1983). The theory identifies and examines institutional factors that promote the legitimacy of organisational practices in a business environment (Glover *et al.*, 2014). Public-funded infrastructure is generally driven by pollical and economic factors which influence their implementation (Cheelo and Liebenthal, 2020) and inadvertently ISD initiatives in the construction industry. The critical considerations in the current research are to understand how institutional factors, namely regulatory compliance and government support, influence KT in ISD initiatives implemented through SME oriented public procurement policies and regulations. The constructs were adapted from Cai, Jun and Yang (2010), who investigated the influence of institutional environments such as government support, legal protection, and the importance of guanxi in supply chain management in China. The study found that government support and the importance of guanxi affect trust, and subsequently, information sharing and collaborative planning.

The theory also draws on extant literature by Chu *et al.* (2017) and Zhu and Sarkis (2007). Chu *et al.* (2017) investigated the impact of government, customer, and competitive pressures, on the environmental and operational performance of organisations and found that the factors significantly impacted organisational performance. Moreover, in the study of the moderating role of institutional factors on green supply chain practices and performance, Zhu and Sarkis (2007) found that manufacturing companies facing higher regulatory pressures tended to implement green purchasing better. Similar studies have acknowledged the critical role of institutional factors in implementing SME-oriented public procurement policies (Grandia and Meehan, 2017; Patil, 2017; Loader, 2017; Flynn, 2018; Hawkins, Gravier and Randall, 2018). However, the studies did not empirically investigate the impact of institutional factors on KT.

In the current research, the institutional theory, together with the knowledge-based view, is used to answer RQ4: More precisely, *do institutional factors moderate the relationship between ISD initiatives and KT?*

4.3 Model explanation and hypotheses development

The proposed model in Figure 4-1 provides a pictorial representation of how the five ISD initiatives, AC, institutional factors are linked to KT and operational performance. The Figure also indicates the hypotheses tested in Chapter 7 to determine the significance of the hypothesised relationships.

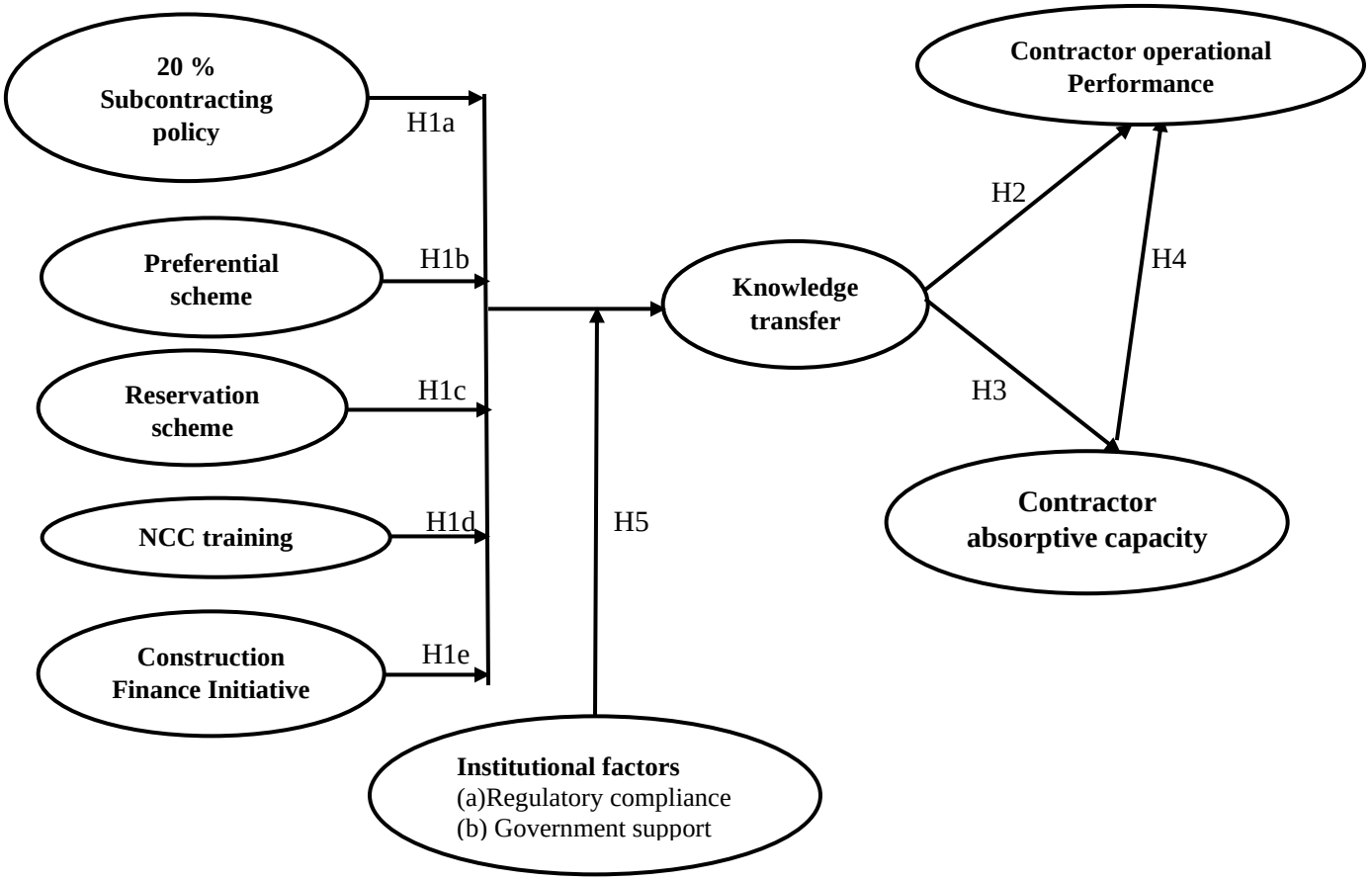


Figure 4-1 Conceptual framework

Source: Researcher (2019)

4.3.1 Hypotheses

1. **H1a:** ISD (20 per cent subcontracting policy) is positively associated with KT.
2. **H2b:** ISD (Preferential scheme) is positively associated with KT.
3. **H3c:** ISD (Reservation scheme) is positively associated with KT.
4. **H4d:** ISD (NCC training programme) is positively associated with KT.
5. **H5e:** ISD (Construction Finance Initiative) is positively associated with KT.
6. **H2:** KT has a positive influence on the operational performance of local contractors.
7. **H3:** KT has a positive influence on the AC of local contractors.
8. **H4**: AC has a positive influence on the operational performance of local contractors.
9. **H5a**: Regulatory compliance moderates the relationship between ISD initiatives and KT.
10. **H5b**: Government support moderates the relationship between ISD initiatives and KT.
11. **H6**: AC mediates the relationship between KT and the operational performance.

4.4 Hypotheses development

4.4.1 Linking ISD initiatives to KT

Lawson, Krause and Potter (2015) conceptualise supplier development as a bilateral knowledge sharing process that contributes to improved supplier performance. The research argues that a pivotal aspect of supplier development is KT from education and training, on-site problem solving, investment in human and organisational resources to improve supplier learning intent and capabilities (Modi and Mabert, 2007; Wagner, 2010; Krause, 2014). Furthermore, Chen, Ellis and Holsapple (2015) describe supplier development as a knowledge sharing paradigm, which stresses the importance of knowledge to both the buyer and supplier in improving performance.

Additionally, using the knowledge chain theory Chen, Ellis and Holsapple (2018) argue that both buying and supplying organisations should prioritise knowledge management in supplier development to achieve desired outcomes. In this context, KT from organisational actors such as individuals, teams, and the organisation itself is shared with another organisation (the supplier) and subsequently contributes to performance improvement (Nagati and Rebolledo, 2012).

For instance, Kim (1998) cites a classic example of how Hyundai's first production relied on divisional team members' experience and outside engineers from Ford for tacit knowledge related to its first automobile production in 1967. Similarly, Toyota's supplier development in the implementation of the Toyota Production System is another typical example of KT in supplier development. In order to develop supplier capabilities through the adoption of the Toyota Production System, Toyota engaged in supplier training and seconded engineers to supplier organisations as part of supplier development (Wagner and Krause, 2009). These activities stimulate KT because they involve some level of interaction between the buyer and supplier employees (Modi and Mabert, 2007).

Supplier development initiatives have been extended to public procurement through ISD initiatives to develop SME capacity through KT (Arráiz, Henríquez and Stucchi, 2013). For instance, Arroyo-López, Holmen and de Boer (2012) found that ISD initiatives in Mexico facilitated KT and subsequent improvement of supplier capabilities and competitiveness in the automotive industry. Furthermore, Dapaah, Thwala and Musonda (2016), in their evaluation of contractor development programme in South Africa, found that the programme leads to contractor upgrades in registration status and increased participation in the construction industry, albeit some gaps for further improvements. However, in the Zambian context, Cheelo and Liebenthal (2020) opine that the implementation of ISD initiatives, particularly the 20 per cent subcontracting, has not been successful

because of the limited and weak implementation framework. The above findings reinforce the importance of KT from ISD initiatives, as depicted in the conceptual framework above.

In line with the preceding discussion, the research study examines how ISD initiatives such as the 20 per cent subcontracting policy, Preferential and Reservation schemes, NCC training programme and the Construction Finance Initiative are associated KT in the construction industry. The knowledge-intensive and transient nature of organisations in the construction industry presents unique challenges that result in KT discontinuities within and between organisations (Smyth and Duryan, 2020). In addition to this challenge, project-based organisations such as the construction industry have received relatively less scholarly attention on knowledge management and still requires further examination (Ali *et al.*, 2018). Therefore, the study hypothesises that ISD initiatives are associated with KT in the construction industry, specifically:

1. ***H1a:*** *ISD (20 per cent subcontracting policy) is associated with KT.*
2. ***H1b:*** *ISD (Reservation scheme) is associated with KT.*
3. ***H1c:*** *ISD (Preferential scheme) is associated with KT.*
4. ***H1d:*** *ISD (NCC training programme) is associated with KT.*
5. ***H1e:*** *ISD (Finance Construction Initiative) is associated with KT.*

4.4.2 Linking KT to operational performance and AC

There is growing recognition that knowledge management improves organisational performance through effective KT and application (Chen, Ellis and Holsapple, 2018). The knowledge-based view theory has identified knowledge as a strategic resource that should lead to positive competitive performance outcomes (Grant, 1996). Zhang and Lyles (2018) further argue that knowledge is a critical resource, and the ability to absorb knowledge and apply it correctly has a persisting positive effect on operational performance improvement. In the context of supplier development, many studies highlight the effect of supplier development on KT and supplier performance improvement (Wagner and Krause, 2009; Rebolledo, Halley and Nagati, 2009; Gosling *et al.*, 2015). For example, Modi and Mabert (2007) assert that KT leads to continuous improvement in the supply chain, resulting in performance outcomes such as cost reduction, improved quality, and productivity improvement.

Furthermore, Wuryaningrat (2017) conducted a study on knowledge sharing and innovation capabilities among SMEs in Indonesia. The study found that knowledge donation and collection positively impact SME's innovation capabilities when AC is developed. The research study argues that new knowledge produced from knowledge sharing among collaborating members may be transformed into innovation capabilities if higher levels of AC support it. Saenz, Revilla and Knoppen

(2013) argue that selecting supply chain partners must consider organisational compatibility and the AC as an essential facilitator of KT and operational improvement. Finally, in their study of high-tech manufacturing companies in China, Duan, Wang and Zhou (2020) argue that supplier development activities such as training enhance AC levels through improved interaction between individuals or groups. The interactions lead to expanding the existing knowledge and possibly exploiting the knowledge to new innovative products. Research has consistently converged on the argument that KT leads to improved AC and performance through effective knowledge exploitation (Liao, Fei and Chen, 2007; Ali, Musawir and Ali, 2018). However, it remains unclear whether this is the case with KT in ISD initiatives. Therefore, the study posits that:

6. ***H2:*** *KT has a positive influence on the operational performance of local contractors.*
7. ***H3:*** *KT has a positive influence on the AC of local contractors.*

4.4.3 Linking AC to operational performance

Zhang and Lyles (2018) argue that AC has a positive influence on performance and capabilities improvement, including innovation. However, few organisations fully exploit the knowledge beyond their organisational boundary mainly because of limited AC (Rebolledo *et al.*, 2009). Chen and Chang (2012) narrow the performance indicator of AC to operational levels as improvements in product quality, productivity, and profitability. The argument is echoed by Saenz, Revilla and Knoppen (2013). Saenz, Revilla and Knoppen (2013) argue that, in the buyer-supplier relationship, AC outcomes also improve operational efficiency, flexibility, and reliability in addition to innovation outcomes. Moreover, Brettel, Greve and Flatten (2011) acknowledge the importance of AC in generating savings, particularly in product development. The argument is that if an organisation acquires correct knowledge of customer preferences through well-developed potential AC (Lane, Koka and Pathak, 2006; Balle *et al.*, 2020), it should be able to generate savings through realised AC by matching products to customer preferences.

AC enables local contractors to effectively obtain external knowledge from ISD initiatives, integrate it with existing knowledge in an organisation and embed the new knowledge into construction projects. For example, knowledge acquisition facilitates local contractors to identify and obtain knowledge regarding road construction and maintenance, project management, supervision, designing structures, and occupational health and safety through ISD initiatives. Assimilation helps employees to analyse the acquired knowledge leading to a shared understanding of the construction project execution. Transformation helps to structure, interpret, share, and use newly acquired and existing knowledge. Knowledge application enables local contractors to creatively apply the knowledge to meet client and market demands in various construction projects to the required quality,

schedule, and budget. Despite the outlined critical role of AC in the construction industry, project-based organisations suffer from weak AC because of the temporary nature of organisations (Ali *et al.*, 2018). Therefore, it remains unclear the extent of AC and its influence on operational performance in the construction industry. Therefore, the research further postulates that:

8. ***H4****: AC has a positive influence on the operational performance of local contractors.*

4.4.4 Moderating role of regulatory compliance on ISD initiatives and KT

ISD initiatives fall under the context of SME oriented public procurement policy; therefore, they are dependent on the interplay of several political and institutional factors to support the implementation process (Patil, 2017). An effective regulatory system imposes regulatory pressures on both the buyer and supplier to comply with established standards (Scott, 1995; 2014) to provide the parties involved with an adequate protection mechanism against potential denial of responsibility (Li *et al.*, 2016). ISD initiatives are supported by public procurement legislature and policies to ensure compliance by all relevant stakeholders. Compliance with ISD initiatives requires sufficient relevant legal provisions and policies to reduce the uncertainty in the business environment and instil confidence by the parties involved (Li *et al.*, 2016; Ibrahim *et al.*, 2017). Regulatory compliance, especially in contractual obligations, increases trust among parties and, subsequently, information sharing, which opens avenues for KT. Compliance with regulatory obligations can offer incentives for partners to create a predictable environment conducive for KT (Cai, Jun and Yang, 2010). Therefore, the study hypothesises that:

9. ***H5a****: Regulatory compliance moderates the relationship between ISD initiatives and KT.*

4.4.5 Moderating role of government support on ISD initiatives and KT

The role of government in sparing socio-economic development through various business interventions is pervasive in different economies (Cai, Jun and Yang, 2010; Cheelo and Liebenthal, 2020). Generally, government intervention in business is acceptable and significantly influences organisation decisions (Li *et al.*, 2016). Harland *et al.* (2019) argue that information dissemination is one of the critical institutional support measures designed to inform local contractors about the ISD initiatives and access them. Government support in implementing ISD initiatives through timely information dissemination on ISD initiatives, monitoring and providing institutional oversight to enhance KT is critical (Jia, Cai and Xu, 2014). Therefore, the study hypothesises that:

10. ***H5b****: Government support moderates the relationship between ISD initiatives and KT.*

4.4.6 Mediating role of AC on KT and operational performance

Extant literature indicates that KT influences AC by enhancing the efficiency and effectiveness of knowledge acquisition from the external environment and, subsequently, knowledge exploitation (Cohen and Levinthal, 1990, Zahra and George, 2002, Lane, Koka and Pathak, 2006). For instance, Saenz, Revilla and Knoppen (2013) argue that the relationship between supplier development, AC, and performance is not direct. Furthermore, Volberda, Foss and Lyles (2010) add that AC mediates the relationship between speed, frequency, and scale of innovation in R&D activities. Francalanci and Morabito (2008) assert that the integration of the information system only leads to higher performance through AC. Szulanski (1996) also argues that organisations may face enormous challenges in exploiting knowledge from the external business environment without AC. Using data from high-tech manufacturing organisations in China, Duan, Wang and Zhou (2020) found that AC had a significant mediating effect on innovation. In the study of knowledge sharing and project performance, Ali, Musawir and Ali (2018) reiterate that knowledge sharing improves AC, leading to performance improvement. However, there is still limited empirical evidence of the mediating influence of AC on the relationship between KT and operational performance in the construction industry. Based on the preceding arguments, the research study hypothesises that:

11. ***H6****: AC mediates the relationship between KT and the operational performance*.

4.5 Control variables

In the current research study, company age and number of employees are the main control variables because they can influence KT from ISD initiatives and, subsequently, operational performance. The number of years in operation measures the company's age since the establishment of the construction company. Company age is the proxy measure of the contractor's accumulated knowledge stock (Tarifa-fernández and Cespedes-lorente, 2019). Company age can impact the contractor's ability to gain knowledge faster and efficiently because of experience in handling projects and relying on institutional memory.

The number of employees was a proxy measure of the company size (rated by the number of employees on a 4-point scale, e.g., 1: below 25; 2: 26 to 50; 3: 51-75 and 4: above 76 employees). The size of the company may affect KT, which resides and is shared by employees. Company size can affect performance because organisations with more employees possess more slack resources for learning (Wagner, 2010; Tarifa-fernández and Cespedes-lorente, 2019). Consequently, they have an advantage in knowledge acquisition, assimilation, transformation, and exploitation for commercial value.

4.6 Chapter summary

This chapter has presented the theoretical and conceptual framework and hypotheses that explain the relationships between the variables. The chapter used the knowledge-based view, AC, and institutional theories to address the research questions. The chapter also outlined the hypothesised relationship between ISD initiatives, KT, and, subsequently, the operational performance of local contractors. Additionally, the chapter presented the mediating effect of AC on the relationship between KT and the operational performance of local contractors and the moderating effect of regulatory compliance and government support on the relationship between ISD initiatives and KT. This chapter advances a more nuanced understanding of how ISD initiatives lead to KT and, subsequently, operational performance.

The following chapter presents the methodology and methods used in the research study. Chapter 5 focuses on the procedure followed in conducting the research and is primarily concerned with the choices and justification of appropriate methods adopted.

CHAPTER 5

METHODOLOGY AND METHODS

5.1 Introduction

This chapter focuses on the procedure followed in carrying out the research process. Furthermore, the chapter outlines the choices of the appropriate methods by which the validity and reliability of the research findings were anchored. In order to select a suitable methodological approach, philosophical assumptions were reviewed to determine the most appropriate to the research study with justifications. Based on the philosophy adopted, the study approach to theory development, research design, strategies, sampling procedures, data collection, measurement scales, and analysis tools were selected and justified. The study followed a concurrent approach to data collection; that is, both qualitative and quantitative data were collected and analysed simultaneously. Moreover, the chapter outlines procedures for reliability and validity analyses. The chapter concludes with a discussion of ethical issues considered in the research.

The chapter is organised as follows: Section 5.2 presents the research philosophical underpinnings. Section 5.3 outlines the research approaches to theory development. Section 5.4 sets out the research design and research strategies in section 5.5. Furthermore, a discussion of the qualitative and quantitative research study methods is followed by data collection, construct validity analyses, ethical considerations in Sections 5.6, 5.7, 5.8, 5.9, and 7.10, respectively. Section 5.11 concludes with the chapter summary.

5.2 Research philosophical underpinnings

The research philosophy is concerned with the researcher's beliefs and assumptions about the development of knowledge. In contrast, the research paradigm is a set of beliefs that guide the researcher's actions and choices in the research process (Saunders, Lewis and Thornhill, 2019). Burns and Burns (2008) assert that the paradigm is a particular way of viewing the world, perceptions, and beliefs about the world that drive the research process. It should be noted from the outset that there is no single best philosophy of research for business and management research. Each philosophy contributes to a unique and valuable way of making sense of the organisational world, and each has its advocates and critics (Saunders, Lewis and Thornhill, 2019). Nevertheless, the important research philosophical assumption that may potentially affect the research approach includes ontological, epistemological, and axiological assumptions (Saunders, Lewis and Thornhill, 2019).

5.2.1 Ontological, epistemological, and axiological assumptions

Ontological assumption refers to the nature and meaning of social reality (Saunders, Lewis and Thornhill, 2019). It seeks to explain what exists and their interactions globally (Ghauri and Gronhaug, 2010). The ontological assumptions that the researcher makes determine the research objectives and phenomena to be focused on and how to view and approach them. Epistemology refers to assumptions about what constitutes valid and legitimate knowledge and how it can be disseminated to actors (Saunders, Lewis and Thornhill, 2019). The epistemological assumptions made by the researcher have a bearing on what kind of contribution the research findings can make to knowledge.

Moreover, the axiological assumption refers to the role of values and ethics in the research process, which includes questions about how researchers deal with their values and those of respondents (Saunders, Lewis and Thornhill, 2019). The argument here is that the researcher's beliefs and values impact the research results because of the many choices that the researcher needs to make in the research process.

5.2.2 Positivism philosophy

The main philosophies worthy of discussing in business and management research are positivism, interpretivism, and pragmatism (Creswell, 2014).

Positivism research philosophy is based on natural scientists' belief in hard facts, the existence of objective truth in the world, which can be discovered and analysed using scientific methods (Silverman, 2010). This research philosophy holds a deterministic stance in which causes determine effects or outcomes, thereby taking a quantitative research strategy (Creswell, 2014). In this philosophy, the research seeks to determine the relationship between variables and advances this through hypotheses testing. A researcher with a positivist stance tries to remain neutral and detached from the research process and data in order to avoid affecting research findings (Saunders, Lewis and Thornhill, 2019).

5.2.3 Interpretivism philosophy

Proponents of the interpretivism research philosophy argue that humans are different from physical phenomena because of their differences in cultural background and, therefore, create different meanings and different social realities (Saunders, Lewis and Thornhill, 2019). Interpretivists are critical of the positivist attempts to generalise a universal law to different contextual realities. Individuals develop multiple subjective meanings based on their experiences towards particular objects. Therefore, research in this context looks at complex views rather than narrow meanings into a few categories (Creswell, 2014). In order to understand this reality, a researcher must undertake in-depth studies and make sense of the process using an inductive reasoning approach (Bryman, 2012).

5.2.4 Pragmatism philosophy

Furthermore, a pragmatic research philosophy takes a conditional approach and reflects on the practical consequences to be essential components of meaning and truth. Truth is what works at a time in this context; therefore, it takes a middle space between positivism and interpretivism (Saunders, Lewis and Thornhill, 2019). The pragmatic research philosophy arises from the need to take action on a particular situation and its consequences rather than focusing on the conditions of a particular method. The emphasis here is understanding the research problem and the actions needed to address it (Saunders, Lewis and Thornhill, 2019).

5.2.5 Justification for the philosophical choice

This study adopted a positivist research philosophical stance because the research followed a hypothetico-deductive approach and the conceptual framework developed in chapter 4 with related hypotheses. The significant aspect of the research focused on testing hypotheses adduced in chapter 4. The primary quantitative research study sought to understand the nexus among ISD initiatives, KT, and, subsequently, the operational performance through a survey of local contractors in the construction industry in Zambia. This resulted in seven hypotheses which were empirically tested using the statistical package for social science (SPSS) and Hayes (2018) bootstrapping procedures for testing mediation and moderation analysis in chapter 7.

However, the findings from the quantitative study were contextualised and supplemented by the qualitative findings from the nine expert interviews. The qualitative study sought to identify the main institutional factors that influence the implementation of ISD initiatives and how experts perceive the effectiveness of ISD initiatives for local contractors in the construction industry in Zambia.

5.3 Research approaches to theory development

There are main approaches to theory development; these are deductive and inductive approaches. The deductive approach is concerned with theory testing to understand the causal relationship between variables (Saunders, Lewis and Thornhill, 2019). The deductive approach is underpinned by the positivist research philosophy using a highly structured methodology to facilitate the replication of findings (Creswell, 2014). Additionally, the deductive approach requires the operationalisation of variables in such a way that the facts can be measured quantitatively (Sekaran and Bougie, 2016). Furthermore, the reliability and validity tests ensure the generalisability of the findings to the rest of the population (Saunders, Lewis and Thornhill, 2019).

Furthermore, a deductive approach solely focused on testing hypotheses is commonly known as hypothetico-deductive (Martini, 2017). The hypothetico-deductive technique entails formulating

a hypothesis (or a family of hypotheses) based on substantial literature review, drawing conclusions about specific occurrences, verifying the findings, and lastly, confirming or disconfirming the conclusions based on evidence (Martini, 2017).

Contrariwise, an inductive approach is concerned with theory building and emphasises the context of the research study to capture the meanings and perspectives of respondents (Saunders, Lewis and Thornhill, 2019). The inductive approach allows research results to emerge from data-related themes (Silverman, 2010) without limiting it to structured methodologies. The interpretivist research philosophy underpins the inductive approach. It is associated with a qualitative research strategy based on a small sample size to allow for in-depth discussions in order to capture respondent opinions, feelings, and experiences in a natural setting. Figure 5-1 is a summary of the two approaches.

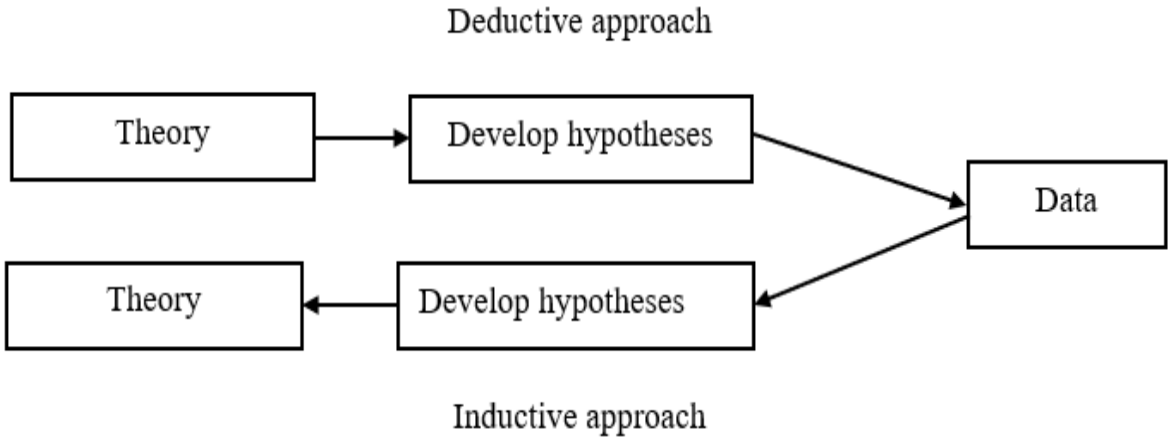


Figure 5-1: Deductive and Inductive approaches.

Sekaran and Bourgie (2016, p.26).

However, some studies use both inductive and deductive approaches, commonly referred to as abductive. Moreover, there is sometimes no clear distinction between a purely deductive or an inductive approach that is likely to be impossible (Saunders, Lewis and Thornhill, 2019). The abductive approach allows the researcher to oscillate between theory and data. The abductive approach follows a pragmatism research philosophy and mixed-method research strategy (Saunders, Lewis and Thornhill, 2019).

5.3.1 Justification for the research approach to theory development

There are no hard and fast rules on the specific approach to be adopted for a particular research. However, the philosophical stance and conceptualisation of the research can provide a basis for adopting a suitable approach. In line with the preceding positivist stance, the research followed a

hypothetico-deductive technique. Martini (2017) argues that the hypothetico-deductive approach is a scientific practice of validating theories by formulating hypotheses and the derivation and testing of conclusions. However, Saunders, Lewis and Thornhill (2019, p.156) guide that that "because pure deduction or pure induction is so difficult to achieve, most management researchers in practice use at least some element of abduction." This study, therefore, adopted some elements of the abductive approach while being predominantly hypothetico-deductive to test the hypotheses.

5.4 Research design

A research design is a step-by-step blueprint of the research sequence for data collection, measurement, analysis, interpreting, and reporting on findings to address the research questions (Creswell, 2014). The research design guides the researcher on critical decisions concerning what data to collect, where, how, and when to collect it. Furthermore, the design guides on how the analysis should be conducted to address research questions (Saunders, Lewis, Thornhill, 2019). The three main research designs in business and management research are exploratory, descriptive, and explanatory. The selection of the research is based on research philosophical assumptions and the research approach adopted by the researcher (Ghauri and Gronhaug, 2010). Each design or combination serves a different purpose based on the research problem (Sekaran and Bourgie, 2016).

The exploratory research design is widely used in interpretivism research philosophy where a qualitative research strategy is used, in particular, to discover and better understand the essence of the research problem through in-depth and focus group studies (Creswell, 2014). Bryman (2012) argues that an exploratory design renders itself well on topics with relatively little prior research and qualitative research is appropriate because it is associated with generation rather than theory testing.

In contrast, a descriptive research design is appropriate when the importance is on describing the attributes of the problem and the relationship between variables (Sekaran and Bourgie, 2016). The descriptive design can be either cross-sectional or longitudinal, depending on the problem under investigation. Moreover, in a cross-sectional design, the fixed sample is measured at a single point in time. However, Bryman (2012) provide a caveat that a cross-sectional survey has a limitation in testing causality because it measures a fixed sample at a point in time. A remedy to the cross-sectional design is the longitudinal research design. A sample is measured repeatedly over time in a longitudinal study (Bryman, 2012; Creswell, 2014). However, a longitudinal design suffers from the time and cost involved.

The explanatory or causal study design is acceptable when the research needs to assess the causal relationship between the independent and dependent variables using inferential statistics. When faced with several variables (causes), they should be separated (control of exogenous variables)

in order to analyse the relevant variables that result in an actual effect (Sekaran and Bougie, 2016). This design is characterised by hypothesis testing of significance and is widely used in experimental studies to establish cause-and-effect (Creswell, 2014). The explanatory research design is widely applied in the positivism research philosophy using a quantitative research strategy (Saunders, Lewis and Thornhill, 2019).

Furthermore, mixed research designs such as exploratory sequential, explanatory sequential, or integrated are also becoming popular in addressing research problems that cannot be studied using a single research design (Creswell, 2014). The rationale for mixed research design includes the need to optimise the sample, enhance the appropriateness of the data collection instruments, and maximise the interpretations of results (Onwuegbuzie, Bustamante and Nelson, 2010). Furthermore, the mixed research design also renders itself to data triangulation, where data from both qualitative and quantitative sources is simultaneously collected and analysed to enhance the validity of findings.

5.4.1 Justification for the research design

The research sought to identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. Furthermore, the study endeavoured to establish which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT. Furthermore, the research examined the effect of KT on the operational performance of local contractors. Additionally, the study investigated the mediating role of AC on the relationship between KT and operational performance and the moderating effect of institutional factors on the relationship between ISD initiatives and KT in the construction industry in Zambia. In order to address these objectives, the research study utilised both exploratory research design and a cross-sectional descriptive survey referred to as *exploratory-descriptive concurrent* design, as demonstrated in Figure 5-2. In line with this design, a mixed-method research design approach was appropriate in which both the qualitative and quantitative studies were conducted concurrently.

However, as earlier mentioned, the study was predominantly quantitative, and the contextualised qualitative findings supplemented the survey findings. The design is consistent with the work of Sánchez-Rodríguez, Hemsworth and Martínez-Lorente (2005), who used both qualitative and a quantitative cross-sectional descriptive survey to examine supplier development initiatives on purchasing performance in manufacturing companies in Spain.

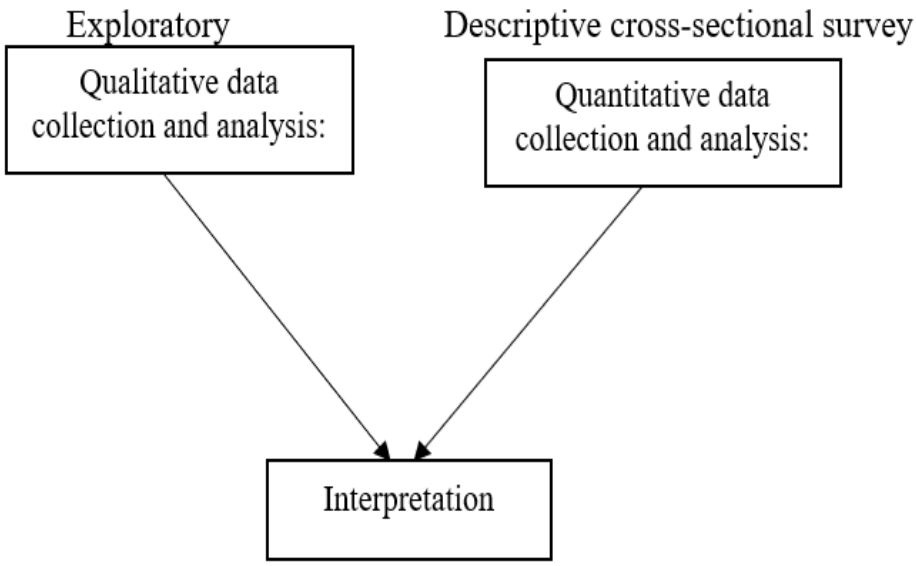


Figure 5-2: Explorative-descriptive concurrent design

Source: Researcher 2020

The qualitative-explorative research design was appropriate in soliciting opinions, perceptions, and experiences of experts on the main institutional factors that influence the implementation of ISD initiatives and how experts perceive the effectiveness of ISD initiatives in the construction industry in Zambia. The experts interviewed are critical in the development and implementation of ISD initiatives. Their voices helped in enhancing the interpretation of the findings in relation to extant literature. The qualitative research study findings partly addressed research objectives 1, which sought *to identify the main institutional factors influencing the implementation of ISD initiatives.*

The descriptive cross-sectional survey design, on the other hand, helped to establish which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT and the effect of KT on the operational performance of local contractors. Moreover, the descriptive cross-sectional survey design helped to investigate the mediating role of AC on the relationship between KT and the operational performance and moderating effect of institutional factors on the relationship between ISD initiatives and KT. Therefore, to address the above main objectives, a descriptive cross-sectional survey of local contractors was undertaken using a structured questionnaire.

5.5 Research strategies

Research strategies fall within the three main categories: qualitative, quantitative, or mixed-method research strategies, depending on the research problem (Creswell, 2014). The main difference between qualitative and quantitative research strategies borders on the procedure followed to address the research problem. Quantitative research is concerned with testing hypotheses, usually in a controlled environment. The qualitative research study includes in-depth studies and interpretation of phenomena under review in a naturalistic environment (Bryman, 2012; Creswell, 2014). Qualitative and quantitative strategies complement each other, and many studies use both methods to some extent (Sekaran and Bougie, 2016). The research problem influences the reasons for preferring one research strategy over the other and the philosophical assumptions (Ghauri and Gronhaug, 2010).

5.5.1 Rationale for the mixed-method study

The current research study followed a mixed-method research strategy by concurrently utilising both qualitative and qualitative studies, even though it was predominantly quantitative. This research strategy made qualitative and quantitative studies self-serving to achieve what Onwuegbuzie, Bustamante and Nelson (2010) refer to as fidelity of interventions. Fidelity of interventions entails understanding the expert point of view through a qualitative research study, for example, perceptions of experts on institutional factors that influence the implementation of ISD initiatives and to maximise the interpretations of quantitative data. The mixed-method, therefore, used the exploratory-descriptive design to combine qualitative and quantitative research strategies. Creswell (2014) recommends this approach because either extreme has biases and weaknesses. The mixed-method research strategy, therefore, leverages their strengths. Furthermore, by using more than one set of data, the study rendered itself to data sources triangulation, which enhanced the validity of the research (Sekaran and Bougie, 2016).

5.6 Qualitative study-expert interviews

After obtaining the ethical approval letter (approval number HSSREC/00000717/2019) in November 2019 (see Appendix II), appointments were made with relevant experts. However, some opted not to take part in the study. About 15 experts contacted agreed to participate in the interview. Subsequently, expert interviews were conducted between December 2019 and January 2020 using a structured interview protocol developed from the literature review (see Appendix VII). The structured interview protocol consisted of fifteen (15) questions addressing different aspects of the research question.

Furthermore, each expert was given the informed consent letter to read through, and other ethical issues were explained. The interview discussion followed the interview protocol and was audio recorded with the permission of all the experts except for EP 9. Therefore, in the case of expert EP 9, notes were taken during the interview conversation.

The interviewer began by explaining the main ISD initiatives in the construction industry: Preferential and Reservation schemes, the 20 per cent subcontracting policy, NCC training of local contractors, and the Construction Finance Initiative to ensure a focused discussion. After that, a series of questions were asked; for instance, question 1 read: "*How would you assess the current state of ISD initiatives on local contractor development? From your experience, have they been working in building the capacity of local contractors?"* The questions evoked the discussion, and experts shared their opinions and experiences on the subject.

The expert interviews were transcribed, and a Microsoft Word document for every interview was developed. The Microsoft Word documents were analysed using NVivo 12 software by developing codes as guided by the literature review, and some were allowed to develop inductively from the discussion. After repeated reading, the codes culminated in themes that were guided by the research question.

5.6.1 Respondents' profile for the qualitative study

A total of nine face-to-face interviews were conducted, and 8 were audio recorded. Expert 9 did not consent to be recorded; instead, notes were taken during the discussion. The participants were purposively selected based on individual and organisational roles in formulating and implementing ISD initiatives in the construction industry in Zambia. The study initially intended to interview 15 respondents. However, 4 declined, and 2 quasi-institutions referred the researcher to the line ministries, which were part of the respondents. A total of nine (9) interviews were conducted to understand the experiences of experts concerning the main institutional factors influencing the implementation of ISD initiatives. The interview protocol was used throughout the process, covering specific questions while still providing sufficient margin for interviewees on how to respond to capture their opinions and experiences.

The interview covered the effectiveness of ISD initiatives on the capacity development of local contractors. The criteria used to engage local contractors in ISD initiatives, the types and impact of regulations on the implementation of ISD initiatives, the effectiveness of information dissemination on ISD initiatives to local contractors, and the role of oversight institutions. Furthermore, the influence of corruption and unfair competition on the implementation of ISD initiatives and compliance levels were also covered. The qualitative study explored the institutional

factors influencing the implementation of ISD initiatives and the effectiveness of ISD initiatives from the perceptions of experts in the construction industry in Zambia. Table 5-1 summarises the participants' profiles.

Table 5-1: Experts' profile

No	ID	Position of expert	Name of the organisation
1	EP1	President	Professional institution responsible for regulating Purchasing and Supply professionals in Zambia
2	EP2	Director	Government ministry
3	EP3	Secretary General	National association small and medium-sized contractors in Zambia
4	EP4	Consulting engineer	Managing Director of a private engineering consulting company
5	EP5	Procurement manager	Government statutory body
6	EP6	Planner	Government ministry
7	EP7	Chief consultant and researcher	Private business consulting company
8	EP8	Director	Government statutory body
9	EP9	Manager	Government statutory body

Source: Researcher (2020)

The experts for the qualitative study consisted of practitioners responsible for ISD initiatives formulation and implementation. Expert 1 is a former procurement director and current President of a professional institution responsible for regulating purchasing and supply professionals in Zambia. Expert 2 is a director in a government ministry in a unit responsible for the public and private partnerships and is a former procurement director in the government unit responsible for road construction. Expert 3 represents a national association of local contractors in Zambia, whose objective is to have a coordinated voice in lobbying for contracts from the public and private sectors.

Expert 4 is a consulting engineer mainly responsible for quality assurance for clients in the construction industry and a member of the Association of Consulting Engineers in Zambia. Expert 5 is a seasoned procurement professional who has participated in construction works for over 20 years in the private and public sectors. Expert 6 is a planner at the government ministry that superintend over the designing, procurement and construction of all public infrastructure development and construction industry policy in Zambia. The planning department is responsible for coordinating, formulating, and reviewing ministerial policies for implementing infrastructure projects in Zambia.

Expert 7 is a managing consultant, researcher, and former board member of RDA. Expert 8 is a director at the government statutory body responsible for maintaining and constructing public roads in Zambia. Furthermore, expert 9 is a manager at a government statutory body mandated to monitor and regulate all construction activities in Zambia. Regulation is conducted by registering

contractors, infrastructure development projects, and capacity building of contractors in the construction industry. The Interview Protocol is as set out in Appendix VIII. Chapter 6 presents the research findings of the qualitative study.

5.7 Quantitative study-survey of local contractors

5.7.1 Questionnaire measurement scales

Questionnaire measurement scale development is an essential procedure because it significantly impacts the validity and reliability of the research findings and connects the research model to empirical testing. Churchill (1979) proposes the procedure for questionnaire measurement scale development, which is widely used in research. The procedure consists of specifying the domain of variables using exploratory qualitative study if it is not readily available in extant literature. The domain specification is followed by questionnaire development, pilot study, and finally, the main survey.

The variables in the current research were measured on multi-item scales adapted from existing literature in supplier development, KT, AC, and supply chain management. Sekaran and Bougie (2016) guide that sometimes, an established measure can be adapted to suit the research setting. For instance, a scale that is used to measure job satisfaction in the manufacturing company can be modified to suit a water utility company, as long as the wording is appropriately adapted and the measure is retested for reliability and validity. Furthermore, while there are no hard-and-fast rules about the number of items to be included in each scale, Hinkin (1998) suggests that four to six items per scale are adequate to test for item homogeneity within each latent variable. However, the items should be appropriate and should adequately sample the variable. In the current study, all the variables were measured using a minimum of four-item scales, except for the Preferential scheme and Construction Finance Initiative, which had three measurement items each. In the next section, the research study focuses on the measurement items for all the variables used in the conceptual framework.

5.7.2 The 20 per cent subcontracting policy

Subcontracting involves unbundling the contract by the main contractor and sharing the task with a network of subcontractors by capitalising on their capacity (De Silva, Kosmopoulou and Lamarche, 2017). It is a business strategy used by the main contractor to address project uncertainties and minimise operating costs (Choudhry *et al.*, 2012). Subcontracting provides an opportunity for learning to the subcontractor and speedy completion of the project for the main contractor. Subcontracting encourages the main contractor and subcontractor to work together to ameliorate knowledge exchange and experience, which may not be possible without a collaborative relationship.

There are different types of subcontracting depending on the contract; these include labour only subcontracting, trade subcontracting, especially in the building subsector and specialist subcontracting (CIDB, 2013).

For instance, in ISD initiatives, subcontracting of works to local contractors is mainly a policy-driven objective to build contractor capacity through KT from the main contractor to the subcontractor (Maréchal and Morand, 2012; De Silva, Kosmopoulou and Lamarche, 2017). The objective of ISD initiatives is to allow the main contractor to subcontract a percentage of the overall contract value of the project to subcontractors (Choudhry *et al.*, 2012; De Silva, Kosmopoulou and Lamarche, 2017). This approach enhances the participation of local contractors in the economy and capacity building.

Furthermore, with regards to ISD initiatives, subcontracting is characterised by close interactions with the main contractor, on-site problem solving, secondment of technical staff to the subcontractor, and future contracts promised by the main contractor based on the track record of performance. Therefore, the 20 per cent subcontracting policy variable was measured using direct supplier development activities such as on-site problem solving and technical staff secondments (Wagner, 2010). The 20 per cent subcontracting policy entails that 20 per cent value of the contract for all road contracts awarded by the central, quasi, and local governments should be subcontracted to local companies in order to stimulate KT and capacity building of local contractors (Road Development Agency, 2016).

A five-item scale taps the variable 20 per cent subcontracting policy. Four items were adapted from Modi and Mabert (2007) and Wagner (2010). For example, sample items included: “My client and my company engage in consultations while on the project site”; “My client unbundles contracts into appropriate sizes to accommodate small local contractors like my company”; “My client co-allocate technical assistants to my company whenever needed.” One item, “the main contractor, unbundles contracts into appropriate sizes to accommodate small local contractors like my company,” was adapted from Baloyi (2012), who conducted a study on Preferential procurement practices in South Africa in the construction industry.

The variable was anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (where 1= strongly disagree and 5= strongly agree).

Table 5-2: The 20 per cent subcontracting measures

Adapted scale	Sources
My client promised more contracts to be subcontracted to my company for improving current performance.	Modi and Maber (2007); Arroyo-López, Holmen and de Boer (2012)
My client and my company engage in consultations while on the project site	Wagner (2010)
My client unbundles contracts into appropriate sizes to accommodate small local contractors like my company.	Baloyi (2012)
My client provided my company with technical assistants whenever needed	Wagner (2010)
My client assessed my company's performance through a formal evaluation system with established guidelines and procedures.	Modi and Maber (2007)

Source: Researcher (2020).

5.7.3 NCC training programme

Modi and Mabert (2007) characterise supplier training as a KT activity in supplier development. Training enhances individual and organisational AC because it facilitates the interaction between individuals or groups, which expand existing knowledge stock (Duan, Wang and Zhou, 2020; Ling *et al.*, 2020). The research used a four-item scale to measure the training variable; item one on supplier training was adapted from Modi and Mabert (2007) and later used by Nagati and Rebolledo (2012). The item has been used extensively in the field of supplier development as one of the essential aspects of direct involvement in supplier development.

The other three items, namely training in construction project management, skills to undertake estimation and tendering, and enhanced chances of tendering for 20 per cent subcontracting or Preferential/reserved contracts as a result of training, were adapted from the works of Dapaah, Thwala and Musonda (2016). Dapaah, Thwala and Musonda (2016) carried out a performance evaluation of contractor development programmes in South Africa from the perspective of beneficiaries. Their study revealed that while beneficiaries were reasonably satisfied with the training programme. However, the programme had several gaps that needed addressing to make it sustainable.

The variable NCC training was anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (where 1= strongly disagree and 5= strongly agree).

Table 5-3: Training programme measures

Adapted scale for the study	Sources
The training has equipped my company with skills in road construction operations.	Modi and Mabert (2007); Nagati and Cabollebo, (2012); Gosling *et al.* (2015)
The training has equipped my company with construction project management skills	Gosling *et al.* (2015); Dapaah, Thwala and Musonda (2016)
The training has equipped my company with the skills to undertake estimation and tendering	Gosling *et al.* (2015); Dapaah, Thwala and Musonda (2016)
The training has enhanced my chances of tendering for 20 per cent subcontracting and/or reserved contracts.	Gosling *et al.* (2015); Dapaah, Thwala and Musonda, (2016)

Source: Researcher (2020).

5.7.4 Preferential and Reservation schemes

A Preferential scheme is a deliberate arrangement in public procurement where preference is given to a targeted citizen influenced, empowered, and owned company when procuring works, goods, and services (De Silva *et al.*, 2017). The arrangement is applied where local and foreign bidders compete for business and give the local bidder a competitive edge (Marion, 2007). The margin of preference is applied by adding a specific percentage margin to the financial proposal to bidders who do not qualify for the preference, thereby raising their bid price at financial evaluation to the advantage of local bidders (Watermeyer, 2003). Alternatively, a specified percentage discount can be applied to the financial proposal to the bidder who qualifies for the preference. This discrimination in public procurement is undertaken to promote the use of local expertise, materials and integrating citizens into the economy. The Preferential scheme is designed to support some targeted businesses, especially disadvantaged ones such as SMEs, to improve their participation in economic activities through public procurement (Watermeyers, 2003; Ssennoga, 2006).

Furthermore, the objective of a Reservation scheme (set-aside) is to develop targeted businesses by reserving specific public contracts for deserving suppliers (Nakabayashi, 2013). Arrowsmith (2010) asserts that public procurement policies such as Preferential and Reservation schemes are important economic activity stimulants that protect the national industry against foreign competition, remedying economic disparities, and achieving socioeconomic goals.

There are several models used to implement Preferential and Reservation schemes based on specific country procurement regulations. Against this background, the Preferential and Reservation schemes variables were measured using eight proxy item scales, five for the Reservation scheme and three for the Preferential scheme based on the public procurement model suggested by Watermeyer (2003). Furthermore, under the Preferential scheme, item seven was adapted from Marion (2007), who conducted a similar study on bid preferences using data from the California auction for road construction contracts. In Mario's study, SMEs received a 5 per cent bid preference at auctions for

projects using state funds. These measures tap directly into the variables' Preferential and Reservation schemes.

Therefore, the variables Preferential and Reservation schemes were anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (where 1= strongly disagree and 5= strongly agree).

Table 5-4: Preferential and Reservation schemes measures

Scheme		Adapted measures
1. Reservation	Set-asides	Government institutions reserve specific contracts for companies like ours based on the prescribed criteria.
2. Reservation	Qualification criteria	In my opinion, only companies that meet a specified requirement as provided for by the law participate in reserved contracts
3. Reservation	Contractual conditions	Government institutions ensure that contracts below K30 million for civil and road works are reserved for local contractors like my company.
4. Reservation	Contractual conditions	Government institutions ensure that contracts below K20 million for building construction works are reserved for local contractors like my company.
5. Reservation	Offering back	My company is awarded contracts when it satisfies criteria relating to Reservation objectives
6. Preference	Preferences at the shortlisting stage	Government institutions limit the number of contractors who are invited to tender on the basis of Preferential treatment
7. Preference	Award criteria (tender evaluation criteria)	Government institutions adjust my bid price in order to facilitate the Preferential evaluation of a bid
8. Preference	Award tender (selection)	The selection of tenders through Preferential procurement is fair

Source: Watermeyer (2003. p.12) and Marion (2007)

5.7.5 Construction Finance Initiative

The Construction Finance Initiative in the Zambian construction industry is implemented by RDA and NRFA (Road Development Agency, 2016). The objective of the initiative is to facilitate access to finance by local contractors in the construction sector in order to enable them to execute contracts effectively. The main stakeholders for the initiative include commercial banks and insurance companies. Construction Finance Initiative is a type of supplier development where supplier capacity building involves investment in capital, equipment, and material into the supplier organisation to improve their performance (Krause and Scannell, 2002).

However, in the context of ISD initiatives, the investment is not directly from the buying organisation to the supplier; instead, the government or its quasi-institutions facilitate the process as part of the broader socio-economic objective. Therefore, in the current research, this constitutes indirect supplier development because the government and its quasi-institutions signed memoranda

of understandings for local contractors to access finances and equipment in order to participate in construction projects. The measurement items have, therefore, been adapted to the public sector context as an indirect investment in the local contractors to build their capacity.

The study used a three-item scale for the variable Construction Finance Initiative; item one was adapted from Galt and Dale (1991) and later used by Li et al. (2007). Item 2 was adapted from Krause and Scannell (2002) and later used by Li *et al.* (2007). While item three was adapted from Wagner (2006). The items have been used extensively in the field of supplier development, albeit in different sectors and contexts.

The variable Construction Finance Initiative was anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (where 1= strongly disagree and 5= strongly agree).

Table 5-5: Construction Finance Initiative measures

Adapted scale	Sources
Construction financing initiative has given my company access to construction equipment.	Galt and Dale (1991); Li et al. (2007)
Construction financing initiative has given my company capital for new investments in my company.	Krause and Scannell (2002); Li et al. (2007)
Construction financing initiative has given my company financial support for operations	Wagner (2006)

Source: Researcher (2020).

5.7.6 KT

KT involves the organisation's ability to acquire knowledge from the external environment and sharing it internally to improve its operations through the application of knowledge for commercial value (Blome, Schoenherr and Eckstein, 2014; Zhao, Zuo and Nancy, 2015). Supplier development, where a buying organisation with vast experience transfers knowledge to a less experienced supplier organisation to improve its performance, facilitates KT (Wagner, 2010). The variable KT was measured using a six-item scale adapted from Nagati and Rebolledo (2012). The scale was adapted both in terms of the Likert scale used and the sector in which it was initially applied. Nagati and Rebolledo (2012) used a seven-point Likert scale; this research study uses a five-point Likert scale to be consistent with other variables.

Furthermore, the scales were initially used in the manufacturing industry, comprising different operations a supplier may wish to acquire knowledge such as process improvements, total preventive maintenance, quality management, lean manufacturing practices, and productivity improvements. In the same disposition, in the construction industry, there are typical operations that are critical for supplier knowledge acquisition; these include but are not limited to road construction,

project management, road maintenance, supervision skills, designing structures and health and safety structure (Gosling *et al.*, 2015).

The research study applied the adapted scale from the manufacturing sector by Nagati and Rebolledo (2012) with adjustments based on the study by Gosling *et al.* (2015). Gosling *et al.* (2015) examined the impact of supplier development initiatives on key performance indicators in the construction industry. The variable KT was anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (where 1= Strongly Disagree and 5= strongly agree).

Table 5-6: KT measures

Thanks to participating in Government (ISD) initiatives in the last three years:	
Adapted scale	**Sources**
My company has acquired important knowledge in road construction.	Nagati and Cabollebo (2012); Gosling *et al* (2015)
My company has acquired important knowledge in project management.	Nagati and Cabollebo (2012); Gosling *et al* (2015)
My company has acquired important knowledge in road maintenance.	Nagati and Cabollebo (2012); Gosling *et al* (2015)
My company has acquired important knowledge in supervision skills.	Nagati and Cabollebo (2012); Gosling *et al* (2015)
My company has acquired important knowledge in design structures.	Nagati and Cabollebo (2012); Gosling *et al* (2015)
My company has acquired important knowledge in occupational health and safety.	Nagati and Cabollebo (2012); Gosling *et al* (2015)

Source: Researcher (2020).

5.7.7 AC

The current study follows Zahra and George (2002), Flatten, Greve and Brettel (2011) and Dávila *et al.* (2019) definition of AC as a four-dimensional variable comprising of knowledge acquisition, assimilation, transformation, and exploitation. The four dimensions of AC were measured using a seventeen-item scale based on extant literature. Specifically, the items were drawn from the works of Dávila e*t al.* (2019) initially used by Flatten, Greve and Brettel (2011). The study also adapted measures from Saenz, Revilla and Knoppen (2013). Since the seminal publication by Cohen and Levinthal (1990), AC has received significant attention as a field of study with various theoretical and conceptual publications. Most of the studies on AC and its measures have been adapted from the work of Cohen and Levinthal (1990).

The variable AC was anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (where 1= Strongly Disagree and 5= strongly agree).

Table 5-7: AC measures

Adapted scale	Source
Knowledge acquisition	
The search for relevant information concerning our industry is an everyday activity in my company.	Dávila *et al*. (2019) and Flatten *et al.* (2011)
My company motivates its employees to use information sources within our industry.	Dávila *et al.* (2019) and Flatten *et al.* (2011)
My company expects employees to deal with information beyond our industry.	Dávila *et al.* (2019) and Flatten *et al.* (2011)
We share changes in project requirements with the main contractor based on the preferences of our client.	Saenz, Revilla, and Knoppen (2013)
The main contractor's and my company's employees interact frequently.	Saenz, Revilla, and Knoppen (2013)
Knowledge assimilation	
In my company, supervisors and subordinates frequently share information on construction techniques.	Saenz, Revilla, and Knoppen (2013)
New ideas from the main constructors are often communicated between internal departments/units in my company.	Saenz, Revilla, and Knoppen (2013)
Employees in my company share ideas freely with each other.	Saenz, Revilla, and Knoppen (2013)
Employees in my company are willing to accept changes that come as a result of the lessons learnt in a particular construction project.	Saenz, Revilla, and Knoppen (2013)
Knowledge transformation	
Our employees have the ability to structure, and use collected knowledge.	Dávila *et al.* (2019) and Flatten *et al.* (2011)
Our employees have the ability to absorb new knowledge as well as to prepare it for other purposes.	Dávila *et al.* (2019) and Flatten *et al.* (2011)
Our employees successfully link existing knowledge with new insights.	Dávila *et al.* (2019) and Flatten *et al.* (2011)
Our employees are able to apply new knowledge in their construction work.	Dávila *et al.* (2019) and Flatten *et al.* (2011)
Knowledge exploitation/application	
The main contractor and my company make joint decisions on the project.	Saenz, Revilla, and Knoppen (2013)
My company is able to take advantage of new knowledge and apply it to other construction projects.	Saenz, Revilla, and Knoppen (2013)
My company is using knowledge from the main contractor or reserved projects to solve new construction problems.	Saenz, Revilla, and Knoppen (2013)
My company is able to apply knowledge to cope with changing competitive conditions in the construction industry.	Saenz, Revilla, and Knoppen (2013)

Source: Researcher (2020)

5.7.8 Regulatory compliance

Cai, Jun and Yang (2010) characterise regulatory compliance as the extent to which people and organisations comply with existing formal regulatory rules and doctrines in a particular country, region, or sector. Regulatory compliance minimises transactional uncertainty and reputational risk, thereby increasing trust in the market and contracts. Regulatory compliance was measured using a

five-item scale adapted from Cai, Jun and Yang (2010) and initially used by Child, Chung and Davies (2003).

The variable regulatory compliance was anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (where 1= Strongly Disagree and 5= strongly agree).

Table 5-8: Regulatory compliance measures

Adapted measures	Source
The regulatory system protects our interests as local contractors.	Cai, Jun and Yang (2010) and Child, Chung and Davies (2003)
The regulatory system prevents us from being exploited by the main contractors.	Cai, Jun and Yang (2010) and Child, Chung and Davies (2003)
The regulatory system ensures that we are paid on time when we deliver.	Cai, Jun and Yang (2010) and Child, Chung and Davies (2003)
The regulatory system ensures that we make a profit from our business.	Cai, Jun and Yang (2010) and Child, Chung and Davies (2003)
The regulatory system protects us from unfair competition from foreigners.	Cai, Jun and Yang (2010) and Child, Chung and Davies (2003)

Source: Researcher (2020).

5.7.9 Government support

Furthermore, Cai, Jun and Yang (2010) characterise government support in the form of various government interventions in the business sector through friendly policies in specific regions or sectors. The support could also be in the form of policies tailored to specific organisational sizes such as SMEs or types of ownership, for instance, citizen-owned in the form of financial incentives or information dissemination on available opportunities. Government support was measured using a four-item scale adapted from Cai, Jun and Yang (2010).

The variable government support was anchored by a five-point Likert scale as follows: please indicate the extent to which you agree with the following statements (1= Strongly Disagree (SD) and 5= strongly agree).

Table 5-9: Government support measures

In the past 3 years, the government, and its institutions:	
Adapted measures	**Source**
Implemented initiatives such as the 20 per cent subcontracting policy which benefit my company.	Cai, Jun and Yang (2010)
Provided the needed information to my company to participate in government initiatives such as Preferential and Reservation schemes.	Cai, Jun and Yang (2010)
Provided financial support to my company from the Construction Finance Initiative.	Cai, Jun and Yang (2010)
Provided training through NCC to equip my company with relevant skills.	Cai, Jun and Yang (2010)

Source: Researcher (2020).

5.7.10 Operational performance

Participating in ISD initiatives such as the 20 per cent subcontracting policy, Preferential and Reservation schemes, NCC training and Construction Finance Initiative is expected to involve some levels of interaction between the buyer and supplier personnel which should stimulate KT from the buyer to the supplier (Modi and Mabert, 2007; Ali, Musawir and Ali, 2018). KT within supplier development helps the supplier's employees to improve their problem-solving skills and subsequently contribute to operational performance such as quality improvement, cost reduction, delivery on time, reliability, and flexibility (Arroyo-López, Holmen and de Boer, 2012). Therefore, there is a consensus among researchers that supplier development leads to operational performance improvement through KT (Kotabe, Martin and Domoto, 2003; Modi and Mabert, 2007; Lawson, Krause and Potter, 2015).

The local contractor operational performance variable was measured using a six-item scale. Four items were adapted from the prior studies of Lawson, Krause and Potter (2015), who applied the scales in supplier development and new product development. Furthermore, one item from Modi and Mabert (2007) applied the scale in testing the conceptual framework of an organisation's efforts to improve supplier performance. The last item on safety and health from Gosling *et al.* (2015) applied the scale in evaluating supplier development initiatives on project performance. The measures relate to operational project outcomes as a result of KT from ISD initiatives.

The variable operational performance was anchored by a five-point Likert scale as follows: please rate your improvement in operational performance after participation in government coordinated ISD initiatives (1-Significant deterioration, 2-Minor deterioration 3-No improvement, 4-Average improvement, 5-Significant improvement).

Table 5-10: Operational performance measures

Thanks to participating in Government initiatives in the last three years:	
Adapted measures	**Source**
My company is able to deliver projects to quality standards.	Lawson, Krause and Potter (2015)
My company is able to meet project technical objectives	Lawson, Krause and Potter (2015)
My company is able to meet schedule targets	Lawson, Krause and Potter (2015)
My company is able to meet budgeted cost targets	Lawson, Krause and Potter (2015)
My company has improved its project cost compared to three years ago	Modi and Mabert (2007)
My company is able to comply with health and safety standards	Gosling *et al.* (2015)

Source: Researcher (2020).

5.8 Data collection

After the questionnaire measurement scales were established, a survey of local contractors was conducted in the provinces of Lusaka and Copperbelt between January and March 2020. The instrument was also tested for its validity and reliability prior to data analysis. The following sections describe the population, the research sample, and the data collection and analysis procedures for the survey.

5.8.1 Population of the study

Sekaran and Bougie (2016) recommend that the target population must be defined in terms of elements, geographical boundaries, and time where possible. The population for the current study consists of the NCC registered contractors from 2017 to 2019, and the sampling frame consists of 1649 contractors from Lusaka and Copperbelt provinces, which represent about 57 per cent of all registered contractors in Zambia (National Council for Construction, 2019). Furthermore, Lusaka is the capital city of Zambia, where all government headquarters are located. Copperbelt province, on the other hand, is considered the economic hub of the country because of the concentration of mining activities. Mining is the main economic stay in Zambia, accounting for an average of 66 per cent of total exports and about 11 per cent of GDP (World Bank, 2015). Thus, the two selected provinces have the highest concentration of economic and construction activities in Zambia and are fairly representative of the construction industry in Zambia.

In the current research, only four (4) categories of contractors (B, C, R, and ME), which form the core construction activities, were considered. These are general construction and housing (B), general civil engineering (C), general road and earthworks (R), and mechanical engineering works (ME). The NCC registers contractors on a six-tier grading system (grades 1, 2, 3, 4, 5, and 6) using the guidelines indicated in Table 5-11. The grade of a contractor represents the level of competence in terms of limitations on contract value. Grade 1 is the highest level, while grade 6 is the lowest. The current study considered only contractors from grades 3 to 6, as indicated in Table 5-11.

Table 5-11: Guidelines for contractor classification

	CLASSIFICATION GRADE >	1	2	3	4	5	6
1	Professional Staff - Reg. Eng. / QS / Arch. (CVs to be included)	4 No.	3 No.	2 No.	-	-	-
2	Technical Staff - Technicians (Diploma related in Construction field, CVs to be included)	5 No.	4 No.	3 No.	2 No.	1 No.	-
3	Accounting Personnel (Higher qualification)	1 No.	1 No.	1 No.		-	-
4	Accounting Personnel (Basic qualification)				1 No.	-	-
5	Audited Accounts to IAS in English	Yes	Yes	Yes	-	-	-
6	Financial Statements Certified by ZICA Member	-	-	-	Yes	-	-
7	Limitation on Contract Value to be Tendered - Category B	>K55m	>K25m-K55m	>K13m -K25m	>K9m-K13m	>K4m-K9m	>K0.0m-K4.0m
8	Limitation on Contract Value to be Tendered - Category C	>K60m	>K30-K60m	>K20m -K30m	>K13m-K20m	>K4-K13m	>K0.0m-K4.0m
9	Limitation on Contract Value to be Tendered - Category R	>K150m	>K60m-K150m	>K30m -K60m	>K20m-K30m	>K6m-K20m	>K0.0m-K6.0m

Note that the exchange rate is approximate: $1≅ K18 (2020)

Source: Extract from the NCC registration form (2020)

Contractors from grade 3 to 6 consist of SME local contractors with limited experience, financial resources, and equipment; hence can only access contracts up to a specific limit and are the main target for ISD initiatives. Therefore, the available population for the study was 1649 registered contractors from grades 3 to 6 only. Initial contact through emails provided on the register revealed that 400 contractors had ceased their operations because of various reasons since their last registration in September 2019. The summary of the population breakdown is as follows:

Table 5-12: Population breakdown

NCC Registered Contractors as of 19th September 2019		
Grade	All registered contractors in Zambia	Registered contractors-Lusaka and Copperbelt
3	86	66
4	269	174
5	623	215
6	1923	1194
Total	**2901**	**1649**

Source: National Council for Construction (2019)

5.8.2 Sample size

The study divided the population of contractors into strata according to the grade of the contractor. Banning, Camstra and Knottnerus (2012) guide that dividing the target population into strata requires the necessary auxiliary information to be available in the sampling frame. In the current research study, the contractor's grade was used as a basis for the stratification of 1649 registered

contractors from grades 3 to 6 because a contractor can belong to one grade only at a time. The study applied random sampling within each stratum. Stratified random sampling improves the precision within the data since the variance within the stratum is less than the variance from the population as a whole.

In order to determine the sample size, it is important to consider the margin of error and the level of confidence. Creswell (2014) recommends that the first step in determining the sample size is to determine the margin of error the researcher is willing to tolerate (say +/–5 per cent confidence interval). The + /–5 per cent confidence interval represents how accurate the answers given by the sample correspond to the answers given by the population as a whole. The second step is to assess the confidence level for this margin of error (say 5 per cent chance). The third is to estimate the percentage of the sample that will respond in a given way (50 per cent with 50/50 being the most conservative because people could respond either way). These steps helped to determine the required sample size needed for each grade of the contractor in grades 3 to 6. Saunders *et al.* (2009, p.212 and p.585) suggest the following formula for determining the sample size.

$$n = \frac{\mathrm{N(p\%\ X\ q\%\ X\ z^2)}}{\{(\mathrm{N}-1)\mathrm{e}\%^2 + (\mathrm{p\%Xq\%Xz^2})\}}$$

Where:
n is the required minimum sample size,
N is the population size where the sample is drawn from,
ρ% is the proportion belonging to a specified category (if unknown usually 50% is used to give the largest sample size)
q% is the proportion not belonging to the specified category (100%-p%)
z is the z value corresponding to the level of confidence (usually Z= 1.96 for 95%, 2.57 for 99%, 1.65 for 90%)
e% is the margin of error that can be tolerated (usually e%=5%, 1% or 10% in line with Confidence level)

The following sample sizes per stratum and the total sample size for the research study were computed using the above formula.

$$n = \frac{N(p\% \times q\% \times z^2)}{\{(N-1)e\%^2+(p\%Xq\%Xz^2)\}} = \frac{66x50x50x1.96^2}{(66-1)5^2+(50x50x1.96^2)} = 56.4 \cong 56 \text{ (stratum grade 3)}$$

$$n = \frac{N(p\% \times q\% \times z^2)}{\{(N-1)e\%^2+(p\%Xq\%Xz^2)\}} = \frac{174x50x50x1.96^2}{(174-1)5^2+(50x50x1.96^2)} = 119.9 \cong 120 \text{ (stratum grade 4)}$$

$$n = \frac{N(p\% \times q\% \times z^2)}{\{(N-1)e\%^2+(p\%Xq\%Xz^2)\}} = \frac{215x50x50x1.96^2}{(215-1)5^2+(50x50x1.96^2)} = 138.1 \cong 138 \text{ (stratum grade 5)}$$

$$n = \frac{N(p\% \times q\% \times z^2)}{\{(N-1)e\%^2+(p\%Xq\%Xz^2)\}} = \frac{1194x50x50x1.96^2}{(1194-1)5^2+(50x50x1.96^2)} = 290.8 \cong 291 \text{ (stratum grade 6)}$$

The sample size is summarised in Table 5.13 below

Table 5-13: Sample size

NCC Registered Contractors as of 19th September 2019			
Grade	All registered contractors in Zambia	Registered contractors-Lusaka and Copperbelt	A stratified sample of contractors-Lusaka and Copperbelt
3	86	66	56
4	269	174	120
5	623	215	138
6	1923	1194	291
Total	**2901**	**1649**	**605**

Source: National Council for Construction (2019) and Researcher (2020).

Therefore, 605 questionnaires were administered through stratified random sampling to local contractors. A random Table was used to select respondents in each stratum randomly. For example, for grade 3, 56 respondents were randomly selected from 66 using the random numbers generated, as indicated below in Figure 5-3.

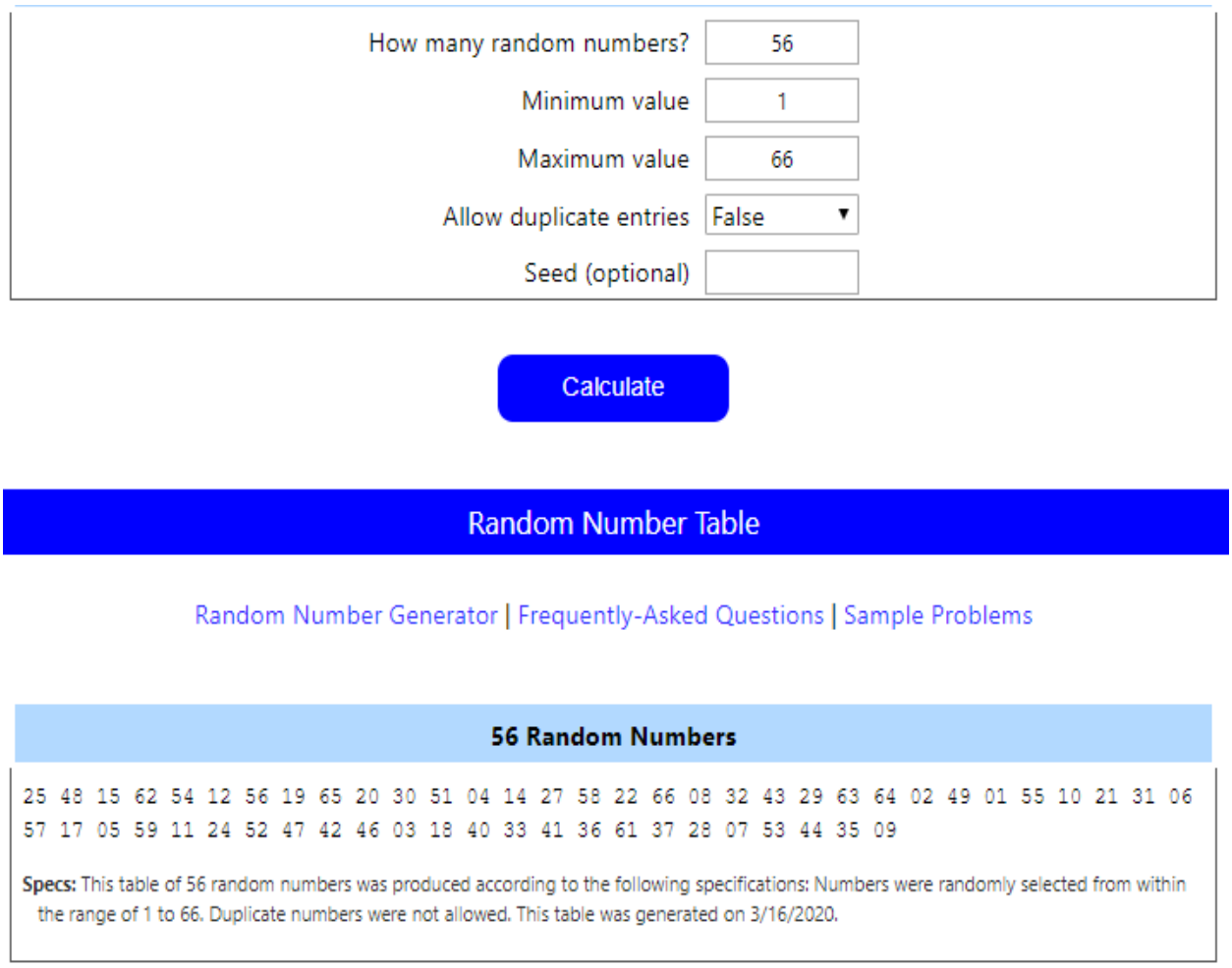


Figure 5-3: Random number generator

Source: Stat Trek (2020)

5.8.3 Data collection instruments

The study used a structured questionnaire to collect data from its targeted sample of 605 local contractors in the Zambian construction industry. The structured questionnaire survey instrument (see Appendix VI) is linked with the deductive approach to theory development in business and management research (Saunders, Lewis and Thornhill, 2019). The researcher adapted questionnaire items from extant literature and ensured that questioning form, wording, and sequence made it easy for the respondents to understand and thereby increasing its face validity (Sekaran and Bougie, 2016). The survey instrument was developed from established scales, as indicated in section 5.7 above on questionnaire measurement scale development.

A two-step pre-test was used to ensure face and content validity. First, four academics in the field of operations and supply chain management provided feedback on how they comprehended the

questions and the questionnaire format. Second, the impressions of seven contractors, particularly on the relevance of the questions in the questionnaire, were incorporated. The contractors for the pilot survey were registered in grades 1 and 2; therefore, they were not part of the main survey.

The unit of analysis in this research is the local construction company represented by a senior member or owner as a respondent. Respondents were requested to give their perception of how ISD initiatives contribute to KT and, subsequently, operational performance improvements. The respondents were asked to refer to a specific relationship between the main contractor or a construction project which they executed through Preferential or Reservation schemes, or the training they received or access to finance within the last three years. This approach is common in supply chain management studies which use a focal organisation and refer to tier 1 supplier or tier 1 customer as a focus of the study in the supply chain (Kotabe, Martin and Domoto, 2003; Modi and Mabert, 2007; Rebolledo, Halley and Nagati, 2009; Lawson, Krause and Potter, 2015).

5.8.4 Questionnaire design

The questionnaire used in this study comprised of eight sections as follows:

1. The cover page containing the details of the researcher, the ethical approval number, and contact details of the research office and instruction to respondents.
2. Section A was designed to collect respondent background information such as the number of years the company has been in operations, gender and the position of the respondent. The section also collected the qualification of the respondent and the category or subsector of the company. The section also collected data on the number of employees and company ownership. This information was vital to increase the confidence of the responses in the questionnaire.
3. Section B sought to gather information on the types of ISD initiatives that the respondent benefited from, the frequency of participation in the ISD initiatives, and the type of support that the respondent company needed most. This information was vital because it established and confirmed whether indeed the respondent has benefited from ISD initiatives, the frequency, and the support they needed to participate in future projects.
4. Section C requested the local contractors to rate the extent of implementation of the ISD initiatives. Respondents were required to indicate the extent to which they agreed with the statements on a five-point Likert scale regarding the level of implementation of the 20 per cent subcontracting policy, Preferential and Reservation schemes, NCC training, and Construction Finance Initiative.

5. Section D sought local contractors' perceptions of KT in ISD initiatives. Respondents were required to indicate the extent to which they agreed with the statements on a five-point Likert scale regarding KT in ISD initiatives in the past three years.
6. Section E sought local contractors' perceptions of institutional factors influencing the implementation of ISD initiatives. Respondents were required to indicate the extent to which they agreed with the statements on a five-point Likert scale regarding institutional factors such as regulatory compliance and government support.
7. Section F sought local contractors' perceptions with regards to activities they undertook in their operations using four-multidimensional measures of AC. Respondents were required to indicate the extent to which they agreed with the statements on a five-point Likert scale regarding AC dimensions, which include knowledge acquisition, assimilation, transformation, and application.
8. Section G requested local contractors to rate their performance after participating in ISD initiatives in the last three years using a structured questionnaire. Respondents were required to indicate the extent to which they agreed with the statements on a five-point Likert scale regarding their operational performance on key performance indicators. Key performance indicators included the ability to deliver the project to quality standards, meet project technical objectives, schedule targets, budgets cost targets and compliance with health and safety standards.

5.8.5 Data collection procedures

After obtaining the ethical approval letter (approval number HSSREC/00000717/2019), in November 2019. The data collection was as follows:

1. The data collection process was conducted between January and March 2020.
2. Eight recent graduates in business studies were oriented and engaged to assist with data collection on the Copperbelt and Lusaka provinces. The research assistants signed a simple contract with clear expectations on data collection procedures and management. The research assistants were given a list of contractors with their contact information, such as Mobile Phone number, Physical address, and email.
3. A total of 305 questionnaires were allocated to Lusaka and the other 300 to the Copperbelt province.
4. After repeated follow up in the interval of one, three, and seven weeks with reminder emails and a total of 176 questionnaires were collected. However, 5 questionnaires were missing

vital information; hence, they were discarded. Therefore, only 171 successfully retained questionnaires were used for analysis.

5.8.6 Response rate and quantitative data analysis procedures

A total of 605 questionnaires were distributed, comprising 305 in Lusaka province and 300 in the Copperbelt province. A total of 176 questionnaires were retained from both Lusaka and Copperbelt provinces. Five of the questionnaires where not complete as vital information was missing; hence they were discarded. The overall response rate was 171/605=28.3 per cent above the typical minimum recommended response rate for external surveys of 10-15 per cent and similar studies in the field of supply chain management and supplier development research (Lawson, Krause and Potter, 2015; Benton, Prahinski and Fan, 2020). Table 5-14 summarises the overall response rate.

Table 5-14: Survey overall response rate

Location	**Frequency (n)**	**Percentage**	**Response rate**
Lusaka	89	52	28.3per cent
Copperbelt	82	48	
Total	171	100	

Source: Researcher (2020)

5.8.7 Initial data examination

The initial data examination and data screening, commonly referred to as ‘data feel’ for the quantitative survey, is an essential aspect of data integrity. This information was further cross-referenced with the quantitative analysis in Chapter 7 to ensure that the information was consistent. Furthermore, Figure 5-5 shows a pictorial summary of the procedure for data analysis, which the current research followed, as suggested by Sekaran (2003).

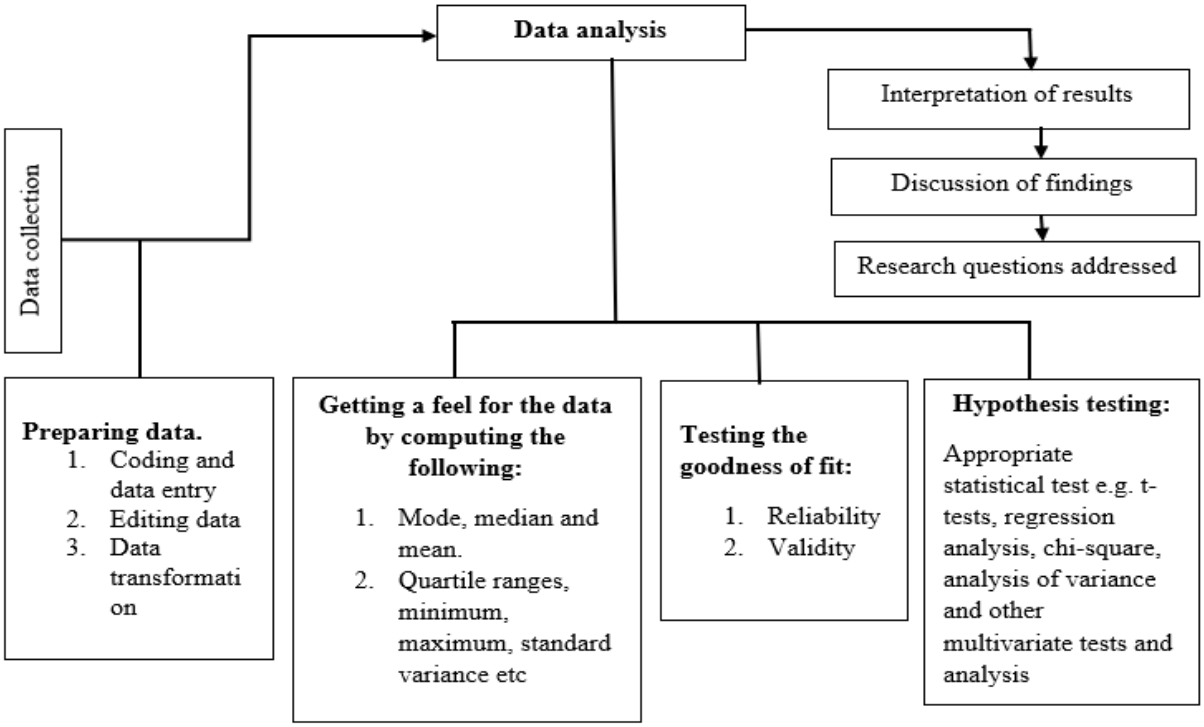


Figure 5-4: Flow diagram of the data analysis process

Source: Sekaran (2003, p.301)

After data collection, initial statistical checks were carried out to ensure that the data met bivariate and multivariate analyses recommended by Tabachnick and Fidell (2007), Burns and Burns (2008), Field (2009), Hair *et al.* (2014) and Sekaran and Bougie (2016). The following activities were involved in the initial statistical checks.

1. Missing data and outliers were examined using descriptive statistics. For example, the examination of descriptive statistics indicated that there were no missing data. Furthermore, visual inspection of boxplots and means indicated that there were no extreme scores in the data.
2. Bivariate and multivariate assumptions such as normality tests, homoscedasticity, and linearity were also assessed (see Appendix VI). For example, Hair *et al.* (2014, p.75) guide that normality can have severe effects in small samples (fewer than 50 cases), but the impact effectively diminishes when sample sizes reach 200 cases or more. The sample size of 171 is sufficient for the data to approach normality according to the central limit theorem (Field, 2009). Furthermore, the examination of skewness and kurtosis scores indices showed that

they were within acceptable limits of ±2 (Field, 2009), and the histogram normal distribution plots indicated that the data is approximately normally distributed.

3. The homoscedasticity of variance assumes that the dependent variable(s) exhibits equal levels of variance across the range of the independent variable. In this study, homoscedasticity was equally not a problem because the regression standardised residual (ZRESID) and regression standardised predicted value (ZPRED) plots were centred around zero for both KT and performance.
4. Linearity was analysed through the normal P-P plot regression of standardised residual, which was plotted as expected along the line. The result further confirmed the normal distribution of the data.

Overall assessment of the assumptions underlying the multivariate techniques revealed relatively little in terms of violations of the assumptions and, therefore, could not present severe problems in data analysis (See Appendix VI: Normality, homoscedasticity, and linearity tests).

5.8.8 Data analysis

Data were analysed using the Statistical Package for Social Science (SPSS) version 23 and Hayes PROCESS Macro version 3.4.1. Data analysis commenced with Exploratory Factor Analysis (EFA), specifically principal component analysis (PCA) with varimax rotation to extract components from the item measurement scale for the constructs used in the questionnaire. Section 5.9.3 presents the results. Having determined the construct validity using PCA, the reliability analyses were carried out using Cronbach's Alpha coefficient to determine the construct reliability of the measurement scales.

Pearson correlations followed the above preliminary analyses to establish the relationships between variables before conducting rigorous statistical analyses. A hierarchical regression analysis followed the preliminary analysis to determine which ISD initiatives are associated with KT. Furthermore, mediation analyses were conducted in SPSS using PROCESS Macro model 4 to establish the mediating effect of AC on the relationship between KT and operational performance of local contractors. Finally, regulatory compliance and government support were introduced as moderators. Moderation analysis was conducted to test the moderation effect of regulatory compliance and government support using PROCESS Macro model 2 (Hayes, 2018). PROCESS Macro model 2 was selected because there were two moderating variables: regulatory compliance (W) and government support (Z). Chapter 7 presents the results of the quantitative data analysis.

5.9 Construct validity analyses

The validity of the scale refers to the accuracy of the measurement scale (Sekaran and Bourgie, 2016). Hair *et al.* (2014) argue that validity is concerned with the extent to which a measure or set of measures correctly represents the concept of study without any systematic or non-random error. Measurement scale development is the starting point of ensuring the validity of the measurement scale by accurately tapping constructs by measurement items, as discussed in section 5.7. In this section, the research study extends some measures undertaken to enhance the validity and reliability of the research findings. These include proactive and remedial measures concerning common method variance, nonresponse bias, PCA, and Cronbach's Alpha reliability analyses.

5.9.1 Common method variance (CMV)

Podsakoff *et al.* (2003) acknowledge that CMV is a problem because it is one of the primary sources of measurement error, which may threaten the validity and reliability of research findings and, subsequently, conclusions about the relationships among variables. CMV is the degree to which estimators of the variable become inconsistent, that is, parameter estimates converge to values different from their true population value due to the presence of systematic variance shared among the variables (Siemsen, Roth and Oliveira, 2010; Tehseen, Ramayah and Sajilan, 2017).

The current research study used one principal respondent from each local construction company to provide data, and items were measured using the perceptions of the same principal respondent. This approach raises concerns about CMV (Podsakoff *et al.*, 2003; Mackenzie and Podsakoff, 2012; Fuller *et al.*, 2016). However, there are several remedies to prevent and tests to check the presence of CMV. Prior to and post data collection, procedural remedies were used to address the CMV. One of the prior data collection remedies to prevent and minimise CMV is in the design of the questionnaire. In this research study, the independent and dependent variables were placed at two extreme ends of the questionnaire with intermediate variables in between. This helped to diminish the effects of consistency motifs (Podsakoff *et al.*, 2003; Flynn, Pacell and Fugate, 2018).

Furthermore, after data collection, the recommended Harman's one-factor test was conducted to evaluate the possibility of CMV (Podsakoff *et al.*, 2003; Tehseen, Ramayah and Sajilan, 2017). Examination of unrotated factor loadings indicated that factor 1 accounted for only 19.2 per cent of the variance from the cumulative percentage of 75.2 per cent in Table 5-15. Therefore, no single factor dominated the variance explained in the data, and CMV was not a problem in the current study (Podsakoff *et al.*, 2003). Besides, SME research argues that a single knowledgeable respondent reflects the views of the organisation as a whole (Kull, Kotlar and Spring, 2018), hence contributes to the validity of the research.

Table 5-15: Factor analysis for all variables

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	per cent of Variance	Cumulative per cent	Total	per cent of Variance	Cumulative per cent
1	11.158	**19.239**	19.239	10.843	18.695	18.695
2	8.950	15.431	34.670	8.667	14.943	33.638
3	4.667	8.046	42.716	4.405	7.595	41.233
4	2.796	4.820	47.536	2.510	4.328	45.561
5	2.623	4.522	52.059	2.320	3.999	49.560
6	2.350	4.052	56.111	2.109	3.636	53.196
7	2.011	3.467	59.577	1.840	3.172	56.368
8	1.900	3.277	62.854	1.556	2.682	59.051
9	1.837	3.168	66.022	1.463	2.523	61.574
10	1.664	2.869	68.891	1.357	2.340	63.914
11	1.411	2.432	71.323	.964	1.662	65.576
12	1.241	2.139	73.462	.920	1.586	67.162
13	1.026	1.769	**75.232**	.731	1.261	68.423
14	.991	1.708	76.939			

Extraction Method: Principal Axis Factoring.

Source: Researcher (2020).

Table 5.15 above indicates that no single factor emerged from the factor analysis or one general factor, which accounted for the majority of the variance among the measures. Therefore, CMV is not a serious problem in this research.

5.9.2 Nonresponse bias (NRB)

Nonresponse bias (NRB) is one of the errors in research which can significantly affect the external validity of research findings. Collier and Bienstock (2007) submit that a non-response error occurs when the information obtained from the respondents differ from that obtained from non-participants due to significant demographic and socio-economic differences. Failure to address non-response bias means that the results may change if non-participants responded to the survey (Armstrong and Overton, 1977). Therefore, for the research to demonstrate external validity and be able to make inferences to the population parameter, it must address the NRB.

Several methods are used to estimate NRB, such as comparing respondents to the population, subjective estimates by looking at demographics of respondents and nonrespondents and extrapolations (Armstrong and Overton, 1977). For example, Armstrong and Overton (1977) suggest extrapolation, which contrasts early and late respondents in the sample study. When there are no significant differences between early and late respondents, it is presumed that NRB does not influence the findings of the survey. Furthermore, Lindner, Murphy and Breirs (2001) recommend that in the

absence of the actual nonrespondents, a sample of early and late respondents can be used to test for NRB.

In this research study, there were two groups: a group of the early 40 respondents and a group of the late 40 respondents who scored on the dependent variable, operational performance. Thirty respondents were selected randomly from each group, and a t-test was performed. The t-test did not indicate any statistically significant difference between the early and late respondents, t (58) = -.109; p=.914. The result suggests that NRB is not a problem in the current research. Furthermore, 40 early and late responses were also tested on each independent variable as summarised in Table -16.

Table 5-16 Comparison between early versus late respondents

Variable	Sig. (2-tailed)	Explanation
Preferential scheme	.325	Differences not significant
Reservation scheme	.798	Differences not significant
20 per cent subcontracting policy	.094	Differences not significant
Training	.262	Differences not significant
Construction Finance Initiative	.286	Differences not significant
Operational performance	.914	Differences not significant

Equal variances are assumed in all cases

5.9.3 Factor Analysis-principal component analysis

The unidimensionality of all the multi-item constructs, namely ISD initiatives, AC, KT, regulatory compliance, government support, and operational performance, was assessed using PCA with varimax rotation. In order to assess the adequacy of the extraction and the number of factors (variables), three criteria were used: eigenvalues, percentage of the variance, and scree plot inflexions. These are standard criteria that apply in different research studies hence are not peculiar to the current research study.

5.9.3.1 ISD-construct validity

The study conducted a PCA with orthogonal rotation (varimax) on the 20 items measuring ISD initiatives. This procedure evaluated the construct validity, the extent to which items in a scale measure the same construct. The Kaiser–Meyer–Olkin verified the measure of sampling adequacy for the analysis, KMO = .776 was far above the acceptable minimum limit of 0.5; therefore, factor analysis was suitable with the current data (Field, 2009; Hair *et al.*, 2014). Besides, Bartlett's test of sphericity χ^2 (190) = 2552.010, p < .001 indicates that the correlation matrix is not an identity matrix, and the dataset was suitable for factor analysis.

Moreover, an initial analysis obtained eigenvalues for each component in the data, which were compared with the scree plot inflexions. The varimax rotation produced a clear structure of factor loadings on a particular component, and factors with loadings above 0.4 were retained as recommended (Burns and Burns, 2008; Hair *et al.*, 2014).

Five components were retained, which had eigenvalues over Kaiser's criterion of 1 and, in combination, explained 72.6 per cent of the variance. Table 5-16 shows the factor loadings after rotation. The items that cluster on the same component suggest that component 1 is a Reservation scheme with a variance explained of 31.4 per cent. Second, component 2 is the 20 per cent subcontracting policy with a variance explained of 15.6 per cent. Third, component 3 is NCC training with a variance explained of 9.9 per cent. Fourth, component 4 is the Construction Finance Initiative with variance explained of 8.4 per cent, and finally, component 5 is the Preferential scheme with variance explained of 7.3 per cent. Item three (Preference3) for the Preferential scheme was later dropped after testing for reliability.

Table 5-17: Factor loadings for ISD initiatives

	Component				
	1	**2**	**3**	**4**	**5**
Retained items					
Reserv4	**.805**	.195	.051	.123	-.082
Reserv3	**.802**	.243	.007	.132	-.068
Reserv5	**.779**	.059	.059	.211	.127
Reserv2	**.685**	.092	.179	-.086	.224
Reserv1	**.618**	.362	.002	.207	.168
Subcon3	.040	**.869**	.142	.079	.064
Subcon4	.087	**.831**	.204	.025	-.012
Subcon5	.395	**.713**	-.056	.247	.053
Subcon2	.395	**.689**	-.133	.277	.158
Subcon1	.367	**.673**	-.094	.247	.146
Ncc_training2	.043	.078	**.918**	.083	.029
Ncc_training3	-.005	.141	**.891**	.031	.129
Ncc_training1	-.006	.058	**.874**	.087	.000
Ncc_training4	.198	-.115	**.800**	-.029	.068
Construct_fin2	.167	.169	.080	**.939**	.048
Construct_fin3	.114	.169	.037	**.928**	.023
Construct_fin1	.167	.166	.073	**.891**	.126
Preferent2	.027	.229	.149	.148	**.748**
Preferent1	-.044	.059	.092	.013	**.741**
Dropped item					
Preferent3	.278	-.054	-.051	.027	.614
Eigenvalues	6.284	3.120	1.979	1.681	1.455
Percentage of variance	31.4	15.6	9.9	8.4	7.3

Source: Researcher (2020).

Note: Reservation scheme is represented by reserv 1 to 5; the 20 per cent subcontracting policy by Subcon 1 to 5; NCC-training by item 1 to 4; Preferential scheme by preferent 1 and 2 and Construction Finance Initiative by construct_fin 1 to 3. However, Preferent3 was dropped because of its impact on the reliability of the factor.

5.9.3.2 AC-construct validity

The study conducted a PCA with orthogonal rotation (varimax) on the 17 items measuring AC. The Kaiser–Meyer–Olkin verified the measure of sampling adequacy for the analysis, KMO = .872 was far above the acceptable minimum limit of 0.5 (Field, 2009; Hair *et al.*, 2014). Moreover, Bartlett's test of sphericity χ^2 (136) = 21676.939, $p < .001$ indicates that the dataset was suitable for factor analysis.

Additionally, an initial analysis was run to obtain eigenvalues for each component in the data, which were compared with the scree plot inflexions. The varimax rotation produced a clear structure of factor loadings on a particular component, and factors with loadings above 0.4 were retained as recommended (Burns and Burns, 2008; Hair *et al.*, 2014). Four components were retained, which had eigenvalues over Kaiser's criterion of 1 and, in combination, explained 69 per cent of the variance.

Table 5-17 shows the factor loadings for AC after rotation. The items that cluster on the same components suggest that component 1 is knowledge transformation with variance explained of 42.5 per cent; component 2 is the knowledge application with variance explained of 11.7 per cent; component 3 is knowledge acquisition with variance explained of 8.8 per cent, and component 4 is knowledge assimilation with variance explained of 6.0 per cent.

Table 5-18: Factor loadings for AC

	Component			
	1	**2**	**3**	**4**
Transformation2	**.875**	.106	.205	.074
Transformation3	**.832**	.071	.232	.141
Transformation1	**.775**	.064	.356	.063
Transformation4	**.739**	.124	.188	.231
Transformation5	**.624**	.027	.066	.484
Transformation6	**.613**	.537	.011	.108
Transformation7	**.604**	.459	.095	-.022
Application1	.119	**.823**	-.011	.215
Application3	.415	**.690**	.105	.122
Application2	.068	**.627**	.522	.043
Application4	-.060	**.615**	.342	.236
Acquisition3	.172	-.037	**.809**	.022
Acquisition1	.271	.251	**.752**	.117
Acquisition2	.341	.230	**.710**	.165
Assimilation2	-.075	.438	.057	**.732**
Assimilation3	.440	.177	.107	**.697**
Assimilation1	.520	.078	.235	**.570**
Eigenvalues	7.222	1.989	1.503	1.012
Percentage of variance explained	42.5	11.7	8.8	6.0

Source: Researcher (2020).

Note: The items represent AC as a multidimensional construct of knowledge acquisition, assimilation, transformation, and application

The four-component factor loadings of AC verified the multi-dimensional nature of the construct from previous studies (Flatten *et al.*, 2011; Arroyo-López, Holmen and de Boer, 2012; Saenz, Revilla and Knoppen, 2013; Zhang, Zhao and Lyles, 2018; Dávila *et al.* 2019). However, certain measurement items were not grouped precisely according to the specified theoretical AC dimensions after rotation. Therefore, the priori AC dimensions were re-specified according to how items were loaded on different factors. For example, the item *'We share changes in project requirements with the main contractor based on the preferences of our client'* initially tapped on knowledge acquisition but was allocated to knowledge application after PCA factor rotation.

The loadings may not be purely attributed to statistical reasons. However, because the item '*'We share changes in project requirements with the main contractor based on the preferences of our client'* could have signalled application of the acquired knowledge when the word '*share*' is underplayed. Other items were re-specified in a similar manner, such as acquisition5 to Application4, Assimilation4 to Transformation5, Application2, and 4 were re-specified to Transformation6 and 7, respectively. This approach is not peculiar to this study alone; other studies such as Arroyo-López, Holmen and de Boer (2012) encountered similar results and applied a similar approach.

5.9.3.3 Institutional factors-construct validity

The study conducted a PCA with orthogonal rotation (varimax) on the 9 items measuring institutional factors. The Kaiser–Meyer–Olkin verified the measure of sampling adequacy for the analysis; KMO = .830 was far above the acceptable minimum limit of 0.5 (Field, 2009; Hair *et al.*, 2014). Additionally, Bartlett's test of sphericity χ^2 (36) = 847.738, p < .001 indicates that the dataset was suitable for factor analysis.

Besides, an initial analysis obtained eigenvalues for each component in the data, which were compared with the scree plot inflexions. The varimax rotation produced a clear structure of factor loadings on a particular component, and factors with loadings above 0.4 were retained as recommended (Burns and Burns, 2008; Hair *et al.*, 2014).

Two components were retained, which had eigenvalues over Kaiser's criterion of 1 and, in combination, explained 67 per cent of the variance. Table 5-18 shows the factor loadings after rotation. The items that cluster on the same components suggest that component 1 is regulatory compliance with variance explained of 51.9 per cent, and component 2 is government support with variance explained of 15.1 per cent.

Table 5-19: Factor loadings for institutional factors

	Component	
	1	**2**
Regu_comp4	**.843**	.220
Regu_comp1	**.823**	.239
Regu_comp2	**.822**	.276
Regu_comp5	**.818**	.190
Regu_comp3	**.803**	.181
Gvt_sup2	.182	**.857**
Gvt_sup1	.134	**.830**
Gvt_sup3	.398	**.617**
Gvt_sup4	.186	**.604**
Eigenvalues	4.671	1.371
Percentage of variance	51.9	15.1

Source: Researcher (2020).

Note: Regulatory compliance was represented by Regu-comp 1 to 4 and Government support by Gov_supp 1 to 4

5.9.3.4 KT-construct validity

The study conducted a PCA with orthogonal rotation (varimax) on the 6 items measuring KT. The Kaiser–Meyer–Olkin verified the measure of sampling adequacy for the analysis, KMO = .863 was far above the acceptable minimum limit of 0.5 (Field, 2009; Hair *et al.*, 2014). Furthermore,

Bartlett's test of sphericity χ^2 (15) = 814.684, p < .001 indicates that the dataset was suitable for factor analysis.

Furthermore, an initial analysis obtained eigenvalues for each component in the data, which were compared with the scree plot inflexions. The varimax rotation produced a clear structure of factor loadings on a particular component, and factors with loadings above 0.4 were retained as recommended (Burns and Burns, 2008; Hair *et al.,* 2014). Only one component was retained, which had an eigenvalue over Kaiser's criterion of 1 and explained 72.8 per cent of the variance. Table 5-19 shows the factor loadings after rotation.

Table 5-20: Factor loadings for KT

	Component
	1
Knowledge4	.908
Knowledge2	.892
Knowledge1	.843
Knowledge3	.840
Knowledge5	.829
Knowledge6	.803
Eigenvalues	4.369
Percentage variance	72.8

Source: Researcher (2020).

5.9.3.5 Operational performance- construct validity

The study conducted a PCA with orthogonal rotation (varimax) on the 6 items measuring operational performance. The Kaiser–Meyer–Olkin verified the measure of sampling adequacy for the analysis, KMO = .897 was far above the acceptable minimum limit of 0.5 (Field, 2009; Hair et al., 2014). Besides, Bartlett's test of sphericity χ^2 (15) = 776.569, p < .001 indicates that the dataset was suitable for factor analysis.

Moreover, an initial analysis obtained eigenvalues for each component in the data, which were compared with the scree plot inflexions. The varimax rotation produced a clear structure of factor loadings on a particular component, and factors with loadings above 0.4 were retained as recommended (Tabachnick and Fidell, 2007; Field, 2009; Hair *et al.,* 2014).

Only one component was retained, which had an eigenvalue over Kaiser's criterion of 1 and explained 74.1 per cent of the variance. Table 5-20 shows the factor loadings after rotation.

Table 5-21: Factor loadings for operational performance

	Component
	1
Performance4	.889
Performance2	.868
Performance3	.862
Performance1	.854
Performance5	.851
Performance6	.838
Eigenvalue	4.444
Percentage of variance	74.1

Source: Researcher (2020).

5.9.4 Reliability analyses

Reliability refers to the degree of internal consistency between multiple measures of the variable and the stability of measures that allow for reproducibility of research findings (Burns and Burns, 2008; Field, 2009; Hair *et al.,* 2014). Reliability is indicative of the homogeneity of the elements in the measurement item that taps the variable; that is how measurement items stick together as a set and can measure the same construct independently (Sekaran and Bourgie, 2016). Cronbach's Alpha coefficient is one of the most popular tests for interitem consistency. In this section, the study examines the Cronbach's Alpha coefficient for the reliability of the variables, and the value ranges from 0 to 1, with values of .60 to .70 deemed the lower limit of acceptability, below 0.6 is inferior, and values above 0.7 are superior (Cronbach, 1951; Nunnally, 1978; Hair *et al*., 2014; Sekaran and Bourgie, 2016).

5.9.4.1 Reliability test for ISD initiatives

As shown in Table 5-21, all Cronbach's Alpha coefficient for all scales except the Reservation scheme is above 0.7, which exhibits excellent reliability (Lu, Lee and Cheng, 2012). The Cronbach's Alpha coefficient for the Reservation scheme is 0.626. However, this is still above 0.6 suggested by Hair *et al.* (2014).

Table 5-22: Reliability tests for ISD initiatives

ISD initiatives	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
20 per cent subcontracting policy ($\propto = .885$)		
Subcon1	.728	.859
Subcon2	.767	.849
Subcon3	.715	.862
Subcon4	.657	.875
Subcon5	.744	.855
Reservation scheme ($\propto = .846$)		
Reserv1	.618	.824
Reserv2	.532	.845
Reserv3	.739	.791
Reserv4	.717	.796
Reserv5	.665	.811
Preferential scheme ($\propto = .626$)		
Preferent1	.456	-
Preferent2	.456	-
NCC training ($\propto = .904$)		
Ncc_training1	.773	.880
Ncc_training2	.859	.849
Ncc_training3	.835	.857
Ncc_training4	.676	.913
Construction Finance Initiative ($\propto = .951$)		
Construct_fin1	.860	.960
Construct_fin2	.944	.894
Construct_fin3	.893	.931

Note: Item Preferent3 was dropped because it adversely affected the reliability

Source: Researcher (2020).

The *Corrected item-total Correlation* column in Table 5.21 shows the correlations between each item and the total score from the questionnaire. The procedure is used to examine the homogeneity of the scale made of several items. If the scale is reliable, all items should correlate with total correlations. If any item correlation is less than 0.3, it means that a particular item does not correlate very well with the scale and may be dropped (Field, 2009). If an item is dropped, factor analysis should be recomputed. In Table 5-21, all data have an item-total correlation above 0.3; therefore, considered.

Furthermore, the values in the column labelled *Cronbach's Alpha if Item Deleted* indicates the overall Cronbach's Alpha coefficient if that item is not included in the calculation of reliability. As a result, they reflect the change in the Cronbach's Alpha coefficient that would be realised if that particular item is deleted (Field, 2009). In Table 5.21 above, there are no values in the column that would significantly change the current overall Cronbach's Alpha coefficient, except for the Preferential scheme. The initial Cronbach's Alpha coefficient reliability for the Preferential scheme

was 0.562, as indicated in Table 5-22 below. After dropping the item 'Preferent3' as highlighted in Table 5-22, the overall Cronbach's Alpha coefficient increased to 0.626.

Table 5-23: Preferential scheme Cronbach's Alpha coefficient before deleting Preferent3

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Preferential scheme (∝=.562)		
Preferent1	.354	.489
Preferent2	.521	.220
Preferent3	.260	**.626**

The rest of the items were retained, as indicated in Table 5.27 above.

Source: Researcher (2020).

5.9.4.2 Reliability test for AC

Table 5-23 indicates that all Cronbach's Alpha coefficients for AC were very close to or above 0.7, which exhibit excellent reliabilities (Field, 2009; Hair *et al.*, 2014). Therefore, all items were retained.

Table 5-24: Reliability tests for AC

AC reliability	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Knowledge acquisition (∝=.795)		
Acquisition1	.728	.630
Acquisition2	.640	.720
Acquisition3	.562	.813
Knowledge assimilation (∝=.678)		
Assimilation1	.507	.579
Assimilation2	.457	.694
Assimilation3	.572	.510
Knowledge transformation (∝=.898)		
Transformation5	.612	.894
Transformation1	.741	.879
Transformation2	.826	.869
Transformation3	.800	.872
Transformation4	.731	.880
Transformation6	.623	.893
Transformation7	.594	.895
Knowledge application (∝=.782)		
Application2	.606	.719
Application4	.563	.742
Application1	.605	.721
Application3	.582	.731

Source: Researcher (2020).

In line with the preceding discussion, all Cronbach's Alphas coefficients were retained in Table 5.23 above because all the *Corrected item-total Correlations* were above 0.3. There are no Cronbach's Alpha coefficients in the column labelled *Cronbach's Alpha if Item Deleted* column, which could significantly change the overall current Cronbach's Alphas coefficient.

5.9.4.3 Reliabilities for regulatory compliance, government support, KT and performance

Similarly, as shown in Table 5-24, all Cronbach's Alpha coefficients for regulatory compliance, government support, KT, and performance were very close to or above 0.7, which exhibit excellent reliability (Field, 2009; Hair *et al.* 2014). Therefore, all items were retained.

Table 5-25: Reliability tests for institutional factors, KT and performance

Institutional factors, KT and operational performance reliabilities	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Regulatory compliance (∝=.906)		
Regu_comp1	.782	.882
Regu_comp2	.798	.878
Regu_comp3	.716	.895
Regu_comp4	.786	.881
Regu_comp5	.742	.890
Government support (∝=.763)		
Gvt_sup1	.596	.688
Gvt_sup2	.680	.640
Gvt_sup3	.551	.714
Gvt_sup4	.437	.775
KT (∝=.924)		
Knowledge1	.774	.912
Knowledge2	.832	.903
Knowledge3	.773	.911
Knowledge4	.854	.901
Knowledge5	.753	.914
Knowledge6	.713	.919
Operational performance (∝=.929)		
Performance1	.784	.917
Performance2	.801	.915
Performance3	.795	.916
Performance4	.837	.910
Performance5	.783	.918
Performance6	.766	.919

Source: Researcher (2020).

In line with the previous discussion, all Cronbach's Alphas coefficients were retained in Table 5.24 above because all the *Corrected item-total Correlations* were above 0.3. There is no Alpha coefficient in the *Cronbach's Alpha if Item Deleted* column, which could significantly change the overall current Cronbach's Alphas coefficient.

5.9.5 Trustworthiness in qualitative research

Qualitative studies consider the trustworthiness of the research as opposed to the validity and reliability concepts used in the preceding sections. Over three decades ago, Guba (1981) proposed four criteria to be considered in qualitative research to enhance the trustworthiness of the research findings. These are credibility, transferability, dependability, and confirmability. These criteria are also recommended by other qualitative researchers (Shenton, 2004; Bryman, 2012). The credibility of qualitative research can be compared to the internal validity in quantitative research, which seeks to ensure that the research measures what it intends to measure (Shenton, 2004). However, Morrow (2005) cautions that the correspondences do not mean that these similar criteria achieve the same objectives as their corresponding standards of rigour in quantitative research.

In contrast, qualitative research leads to different types of knowledge claims than those resulting from the use of quantitative methods. Moreover, qualitative research focuses on one or very few respondents (idiographic), and findings are restricted within the context of the respondents (emic). In contrast, quantitative research uses standardised data collection tools and existing theories (nomothetic) and generalisation of findings to the entire population (etic) (Morrow, 2005).

Research credibility considers the multiple accounts of social reality through the best research practices and respondent validation of the findings (Bryman, 2012). For the current study, credibility was enhanced through prolonged engagement with experts and asking similar questions to all the nine experts interviewed. The approach allowed corroboration of different viewpoints against others in order to get a rich picture of experts' experiences. Moreover, respondents were allowed to review the transcribed record of their responses to ensure that they agreed with the findings. Further, the study used purposive sampling of experts with specific knowledge on the implementation of ISD initiatives. This type of sampling entails that the transferability of findings is restricted within this context and the characteristics of respondents (Bryman, 2012). In qualitative research, where the study takes place in a naturalistic environment, findings cannot be transferred to different contexts (Burns and Burns, 2008).

Similarly, dependability, compared to reliability in quantitative research, was addressed through a detailed description of the methods to ensure a clear audit trail was established (Bryman, 2012). Furthermore, the position of the experts interviewed was included in order to strengthen the dependability of the findings. Besides, details have been provided in terms of how the interviews were conducted. Last but not least, the confirmability of the study was addressed by ensuring that the research was carried out in good faith without undue biases.

5.10 Chapter summary

The chapter provides the rationale behind the pragmatist research philosophy adopted after a review of different philosophical assumptions. Furthermore, the chapter has discussed the different research paradigms, focusing mainly on two extremes, positivist and interpretivist. The research adopted a positivist philosophical stance and a hypothetico-deductive approach in order to test the hypotheses. Furthermore, the two choices were discussed, and justification was provided for the adopted hypothetico-deductive approach.

All aspects and practical considerations such as target population, sampling, data collection, and analysis have been discussed in this chapter. The research study followed a mixed-method research strategy in line with the research problem, the pragmatism research philosophy, and the research design. Therefore, the mixed-method research strategy used the exploratory-descriptive design to combine qualitative and quantitative research strategies, despite being predominately quantitative.

Furthermore, qualitative data from the nine expert interviews were analysed using NVivo 12 to identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. Moreover, quantitative data from the survey of 171 local contractors were analysed using the SPSS and Hayes PROCESS Macro. Analytical techniques such as PCA with varimax rotation, reliability analyses using Cronbach's Alpha coefficient, descriptive statistics, multiple hierarchical regression, mediation, and moderation analyses were employed in data analysis.

Furthermore, the chapter has also addressed the issues of trustworthiness for the qualitative study using four criteria of credibility, transferability, dependability, and confirmability.

The next chapter focuses on qualitative data analysis of the nine expert interviews conducted to explore the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. Chapter 6 will, therefore, provide a context for the discussion of results in chapter 8.

CHAPTER 6

QUALITATIVE DATA ANALYSIS

6.1 Introduction

This chapter presents the findings from the qualitative data analysis of the nine expert interviews conducted to identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. The current chapter is organised as follows. Section 6.2 provides an overview of the qualitative study, followed by the findings of the expert interviews in section 6.3. Section 6.4 presents institutional factors under the regulatory compliance issues and government support in section 6.5. Furthermore, perceptions of the effectiveness of ISD initiatives are presented in sections 6.6, and section 6.7 presents a summary of the chapter.

6.2 Overview of the qualitative study

Public procurement is an essential tool of redistributing resources in the economy using SME oriented public procurement policies and regulations. For instance, the Republic of Zambia government has spent significant resources supporting SMEs through ISD initiatives. The main ISD initiatives in the construction industry are the 20 per cent subcontracting policy, Preferential and Reservation schemes, NCC training, and the Construction Finance Initiative. Experts' responses show that the most popular initiatives in the construction industry are the 20 per cent subcontracting policy, followed by Preferential and Reservation schemes. However, the NCC training and Construction Finance Initiatives were the least popular implementation from experts' perceptions.

Furthermore, the responses from experts show that although ISD initiatives are applied simultaneously and intended to complement each other, there are differences in the level of implementation. For example, in order to successfully participate in the 20 per cent subcontracting policy, Preferential and Reservation schemes, it is expected that a local contractor should adequately be trained and must continue to attend refresher courses at the NCC construction school. Furthermore, if a local contractor has financial challenges for mobilisation and equipment, the Construction Finance Initiative should facilitate access to resources for project implementation.

At present, however, the emphasis is placed on the three main ISD initiatives, namely the 20 per cent subcontracting policy, Preferential, and Reservation schemes. As revealed by the coding preferences, the NCC training, which must act as a lever in capacity building and the Construction Finance Initiative, has not been much attention. Figure 6-1 depicts the number of coding preferences related to the particular ISD initiative.

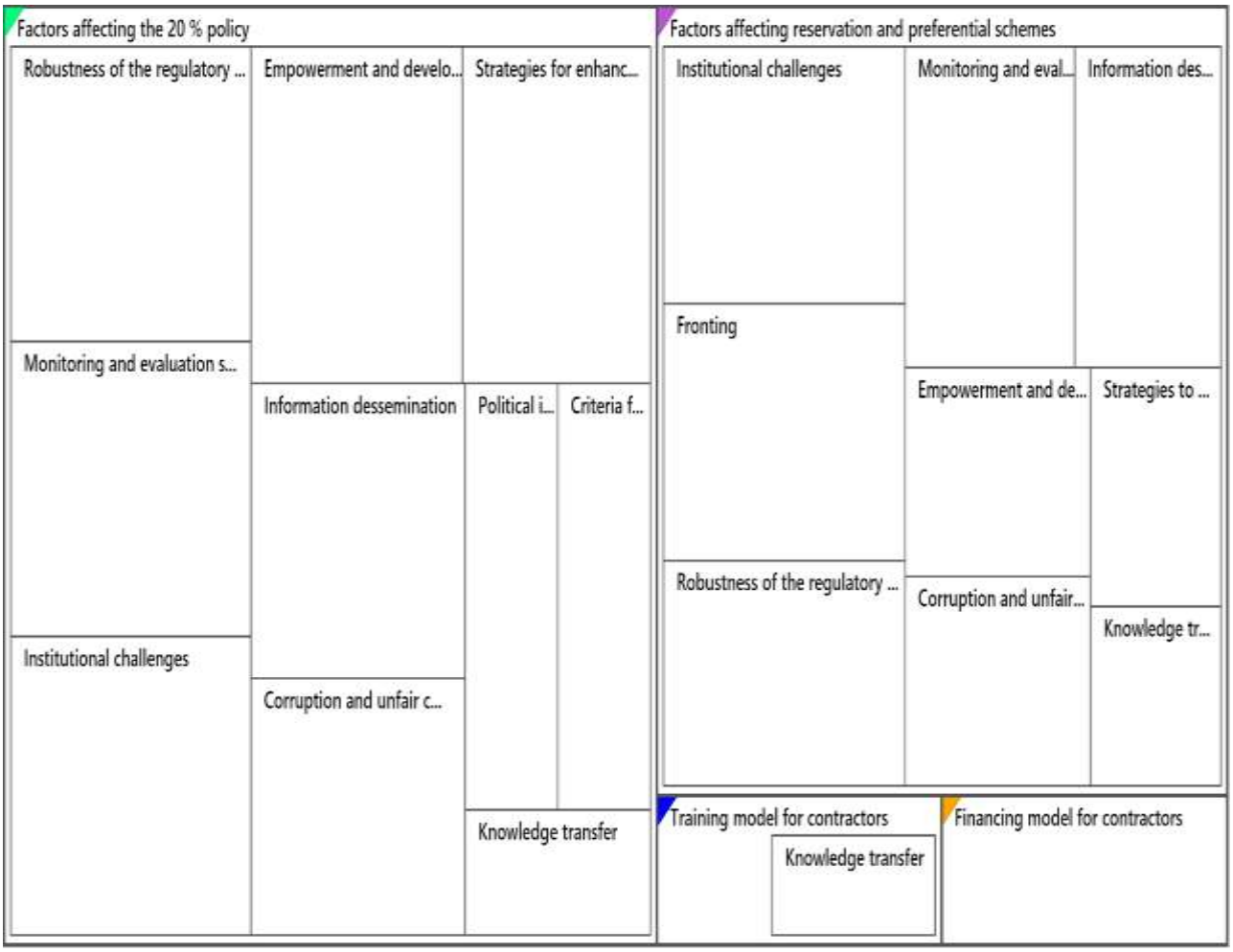


Figure 6-1: Prevalence of institutionalised initiatives revealed by coding references

Researcher (2020)

6.3 Interview findings

Experts' perceptions of the institutional factors that influence the implementation of ISD initiatives (the 20 per cent subcontracting policy, NCC training, Construction Finance Initiative, preferential and reservation schemes) in the construction industry are summarised in Table 6-1. Responses are thematically organised broadly into regulatory compliance issues and government support. The categorising of the factors were guided by the study conducted by Cai, Jun and Yang (2010), initially based on Lewin *et al.*(1999), who developed a framework to describe the national institutional environment. For instance, regulatory compliance issues include political influence and favouritism, corruption and unfair competition, inadequate regulatory system, fronting, unclear criteria for participating in ISD initiatives and administrative, human, and business-related factors. Government support issues encompass information dissemination, weak monitoring and evaluation

systems, training (outdated training, prohibitive costs of accessing training) and Construction Finance Initiative (lack of support from the banking sector). The themes are summarised in Table 6-1.

Table 6-1: Summary of interview findings

Research question	Summary of key interview findings
What are the main institutional factors influencing the implementation of ISD initiatives?	***Regulatory compliance issues*** • Political influence (political favouritism) • Corruption and unfair competition • Inadequate regulatory system • Fronting • Unclear criteria for participating in ISD initiatives • Administrative, human, and business-related factors ***Government support issues*** • Information dissemination on ISD initiatives • Monitoring and evaluation systems • Training (outdated training, prohibitive costs of accessing training) • Construction Finance Initiative (lack of support from the banking sector).

Source: Researcher (2020)

6.4 Regulatory compliance issues

6.4.1 Political influence

There was some consensus among experts that implementing the 20 per cent subcontracting policy is subjected to strong political influence and favouritism. As a result, this affects the implementation of the initiative. Most experts indicated that the initiative is only being used as a political tool rather than an empowerment initiative, thus limiting access to prospective beneficiaries. The findings corroborate similar findings in the literature, which argue that political interference is a significant driver of corruption in the construction industry in Zambia (Kalyongwe *et al.*, 2018). In a related study on the compliance levels to public procurement legislation in Ghana, Ibrahim *et al.* (2017) argue that compliance with the public procurement laws is a significant challenge. Ibrahim *et al.* (2017) lament that this is particularly more prominent in developing countries where political pressure, corruption, and the weak regulatory regime pose compliance challenges to procurement laws.

Below is the quote from one expert on the effect of political influence in the implementation of ISD initiatives:

> *"At the end of the day, not every Zambian construction company benefit; it has become a political tool. Because often, you find untrained contractors engaged, contractors who do not know anything about construction. As far as we are concerned, politicians have taken*

advantage of this initiative and allowed other Zambians not to participate fully. I think we need to change how this is implemented" (EP3).

These findings are consistent with the existing literature, which argues that political values are the vital fabric of any government (Scott, 1995, 2014). For example, Ibrahim *et al.* (2017) rightly acknowledge that public procurement is a highly political enterprise, particularly in developing countries where technocrats are often vulnerable to political pressures. Therefore, institutional forces in the form of political influence can be observed both within organisations and their environments. The institutional forces develop shared understandings of appropriate organisational behaviour through different tools (Cai, Jun and Yang, 2010). However, sometimes political influence adversely affects the implementation of government initiatives.

Furthermore, politicians and politically connected individuals significantly influence government-initiated programmes because of their power and control over technocrats (Patil, 2017). Patil (2017) adds that implementing SME oriented public procurement policies depends on the interplay of political factors and their critical role in supporting the policies. However, sometimes political interference by political representatives delegitimises public institutions in the implementation of government initiatives such as ISD initiatives in the construction industry in Zambia.

6.4.2 Criteria for participating in initiatives

One of the key institutional factors affecting the implementation of ISD initiatives cited by the experts is the unclear criteria used to engage local contractors. Some experts have acknowledged that the NCC six-tier grading system is used as indicated in the quotes below.

"I think they are following the NCC grading system. For one to access a particular kind of work, they must be in a certain grade. I think that is what they are following. The criteria are already there; it is just that one must be in that particular grade, say NCC4 or NCC5, whatever the case may be. So NCC would have assessed you and put you in that grade, then you access work that members in that grade can access" (EP4).

However, other experts indicated that the criteria are unclear, thereby confusing who is eligible for a particular initiative, particularly in the current 20 per cent subcontracting policy. Experts noted that the lack of clear criteria has contributed to the inadequate performance of the initiatives, as indicated in the following quote.

"For the 20 per cent subcontracting policy, there are no clear modalities to guide the main contractor who is supposed to engage you as a subcontractor and the criteria to help the

subcontractor to pursue these opportunities" (EP3).

A transparent and predictable criterion is essential to guide local contractors who wish to participate in the ISD initiatives and can also be used to promote participation. For instance, Kidalov (2013) asserts that including SME local contractors as award criteria to incentivise main contractors to subcontract specific works can significantly enhance the subcontracting environments to local contractors.

6.4.3 Corruption and unfair competition

There was also some consensus among experts that corruption and unfair competition are prominent in the construction industry in Zambia. Experts felt that tenders for construction projects were not competitively awarded, and those awarded contracts somehow had links to some politicians or other influential people. Despite renewing their NCC registration for more than five years, some experts lamented that they had never won a public contract, yet some newcomers were quick to access public contracts. Experts agreed that corruption has a significant adverse impact on implementing ISD initiatives in the construction industry, as highlighted in the quote below by one expert.

> *"Although you cannot see corruption, there is a perception that there is corruption because of the way things are done. Why I say so is that you cannot see corruption because those who benefit from corruption cannot tell you that 'I got this contract corruptly,' and those who say there is corruption cannot say 'this is how it is happening.' Nevertheless, the perception itself is too huge to ignore. So, there is corruption that is inhibiting participation of some Zambians in the various initiatives, because those with money can easily access these opportunities"* (EP3).

Corruption is a pervasive feature in the construction industry perpetuated by other institutional factors such as socio-economic, political, and cultural norms. Shan *et al.* (2015) argue that public construction projects, in particular, face a high risk of corruption because of the complexity of the sector. Furthermore, Kalyongwe *et al.* (2018) assert that the complexity of the construction industry makes it more susceptible to bribery and corruption.

Besides, corruption facilitates unfair competition and an unlevelled playing field for participants in the industry, particularly between local and foreign contractors (Kalyongwe *et al.*, 2018). Unfair competition between local and foreign contractors who have access to cheap finance adversely affects the implementation of ISD initiatives. Experts indicated that some foreign contractors were state-owned enterprises that have access to cheap finance from their governments and are competing with local contractors who are financially constrained. Below is a quote from one

expert on unfair competition:

> *"The procurement system cannot detect unfair competition because it is too mechanical; it is the application of rules. It does not take that into account. I have never seen an advert that says that contractors who are state financed should never tender. No, I have never seen that, so procurement does not address unfair competition. They assume everything is on the level playing field"* (EP4).

Le *et al*. (2014) point out that corruption in the construction industry is perpetrated for many reasons. For example, the significant flow of public money, the competitive nature of the tendering process, lack of transparency in the procurement of construction projects, onerous criteria for tenders, political interference, the complexity of institutional roles and functions, and asymmetrical information between clients, consultants, and contractors. These factors ultimately affect the implementation of ISD initiatives.

Similarly, corruption and unfair competition are also prominent in the implementation of Preferential and Reservation schemes. Akin to the 20 per cent subcontracting policy, corruption is manifested in different forms, and the ultimate result is that it undermines the effective implementation of ISD initiatives (Shabbir, 2014; Kalyongwe *et al.*, 2018). For instance, McKevitt and Davis (2015) assert that to facilitate SME growth; there is a need to level the playing field on which SMEs compete with large organisations. However, corruption creates an unlevelled playing field for SME local contractors to compete effectively in the industry.

Experts also revealed that the implementation of Preferential and Reservation schemes are affected by unbridled corruption and competition from cartels in the industry. Local contractors are not in a position to compete with foreign contractors. For example, some experts observed that local contractors access credit at high-interest rates of over 30 per cent from commercial banks. However, some foreign contractors that are state-owned entities access their credit at a very low per cent rate. These disparities in access to finance significantly disadvantage local contractors. Experts felt that corruption and unfair competition adversely affect the implementation of Preferential and Reservation schemes, as highlighted in the following excerpt:

> *"As far as construction costs are concerned, if I put up my construction costs in Zambia without the help of the bank, even if I reduce them to 20 or 30 per cent [Preferential scheme discount at financial evaluation stage], the foreigner will still win. So, it does not help because foreign contractors come in with their own money at almost zero per cent interest*

rate from their banks, you know most of them are state-owned, and if they are state-owned, can you compete with them?" (EP1).

Experts believed that the procurement law should be able to level the playing field, especially when it comes to competing with state-owned foreign enterprises. This approach will ensure that taxpayers' money is not competed for by another government-owned foreign enterprise. Procuring entities should also be able to disqualify state-owned enterprises immediately before tendering in order to improve the participation of local contractors in public-funded construction projects without unfair competition.

6.4.4 Inadequate regulatory system

Experts noted that the current regulatory system governing ISD initiatives in the construction industry is weak and susceptible to circumvention with impunity. Experts felt that it is difficult for the main contractors to disclose the volume of works contracted and the actual rates used for subcontractors. Nondisclosure of the subcontracted scope of work makes it a challenge to know whether the subcontractors are benefiting from the 20 per cent subcontracting policy. Experts attributed this to the lack of legislation with regards to the 20 per cent subcontracting policy. Some experts suggested the need for a law that might compel the main contractor to apply the same rates approved at the time of the contract award and pass them to the subcontractor. Responses show an urgent need to enact a law that should govern the implementation of the 20 per cent subcontracting policy.

Below is a quote from one of the experts on the current regulatory system:

"You see, there are cases we have experienced, for example. Here is a foreign company that has been given work to do, then what they have done now, they have got a company from abroad that is registered in Zambia. As far as the law is concerned, or rather the subcontracting policy is concerned, it is a local company. So, when you look at the law, it defines a local company as a company registered in Zambia. So, what they are doing is starting to give the same companies contracts, basically to themselves. They, therefore, give 20 per cent to fellow companies, because they are the same companies, sometimes even give more than 20 per cent, they can give 30 per cent or even 40 per cent." (EP5).

The regulatory system also has an impact on the levels of compliance and coordination of ISD initiatives. However, some experts noted that some local contractors were also not complying with the 20 per cent policy because they end up selling contracts to foreign contractors. Furthermore, other experts revealed that, at present, compliance is abysmal due to the reluctance of both main and

subcontractors to comply with the 20 per cent subcontracting policy.

Additionally, experts revealed that at the moment, the 20 per cent subcontracting policy is not mandatory per se. Moreover, the client or main contractor can decide to bring in a subcontractor when they feel like it. As a result, the 20 per cent subcontracting policy has not been effective because subcontracting is considered after the contract award.

The effectiveness of the regulatory system impacts how different initiatives are coordinated to achieve an overarching objective of contractor capacity building and the empowerment objectives, in general. One expert provided the following insight into the current coordination levels of the various initiatives in the construction industry in Zambia.

> *"I am not satisfied with the coordination. Because in the first place, the approach must be holistic in order for it to work, but it is not holistic; it is too focused on procurement. Furthermore, because of this, the emphasis is on how many contracts have been awarded. I would like this programme to be viewed holistically in a diagnostic way. We need to look at the contractor in Zambia and say, what do they need to succeed? What obstacles will they face in the execution of their work? How do we address these problems? We are designing a programme that addresses these issues. Besides, there must be a monitoring mechanism"* (EP4).

Patil (2017) concludes that organisational level planning, administrative coordination, resource allocation, and technical support are critical for implementing SME oriented public procurement policies such as ISD initiatives. Coordination is vital in ensuring that conformance-performance tension in implementing ISD initiatives does not adversely affect the effectiveness of the initiatives.

Unlike the 20 per cent subcontracting policy, the Preferential and Reservation schemes were established by the CEEC Act 9 of 2006. The objective was to ensure that there is a transparent regulatory system to guide their implementation. This legislature is similar to the EU code of best practices facilitating access of SMEs to public procurement contracts (EC, 2008) and the USA Small Business Act (2010) and the Federal Acquisition Regulation (FAR, 2010; Kidalov, 2013), which aim to facilitate the participation of SMEs in the economy.

Experts indicated that lapses in the regulatory system result in foreigners benefiting from the initiatives solely meant to empower local contracts. There was a general feeling that the law, in its current form, is not watertight. Furthermore, experts narrated that procuring entities have not effectively implemented the Preferential and Reservation laws. Experts indicated that lapses in the

regulatory system had contributed negatively to the implementation of Preferential and Reservation schemes, as indicated below:

> *"……but when you look at the way Preferential procurement laws or statutory instruments are crafted, they leave loopholes, such that at the end of the day do not support the local contractors. The way the laws are crafted in those documents ends up benefitting foreigners. For instance, the definition of a citizen and local company by the CEEC Act No.9 of 2006, the Public Procurement Act No. 12 of 2008, Company's Act No. 10 of 2017 and in some cases, the NCC Act No. 13 of 2003 contradict each other"* (EP3).

6.4.5 Fronting

Fronting is a scenario where a foreign company fronts local citizens to register the companies to gain undue benefit from citizen targeted empowerment (Warikandwa and Osode, 2017). Experts acknowledged that fronting is a major challenge in the implementation of Preferential and Reservation schemes in the construction industry, as highlighted in the following excerpt:

> *Fronting is one of the critical institutional challenges facing the construction industry in terms of implementing various government initiatives because it is difficult to prove. Most foreigners know the system and can circumvent it with the help of Zambians. As the regulatory body in the industry, we are trying our best to ensure that it is detected and dealt with as soon as possible. However, if contractors comply with the requirements of the law, even if we suspect that they may be fronts, it is difficult to deal with it, and this has been made even more difficult by Zambians that collude with foreigners"* (EP9).

Experts also noted that there is inadequate institutional capacity in the public sector to properly apply the Preferential and Reservation schemes in the procurement process by procurement officers. Experts felt that most of the adverts that include the application of Preferential procurement do not include them in the solicitation document, making it challenging to apply them at an evaluation stage. Experts noted that bidders were unaware of how the Preferential procurement is applied to ensure that all bidders know how they work.

One expert made the following observation on the application of Preferential and Reservation schemes:

"The problem is the capacity on the procurement side; the procurement officers themselves do not know how to apply them. I have been in procurement, I know exactly; I can tell you that 70 per cent of the procurement officers do not know how to apply those provisions in the way they are calculated, in the way they are applied from the solicitation document. Do not expect to walk into an evaluation meeting, and based on that fact, you say, 'hey guys,' there is CEEC Preferential treatment it needs to apply. You must capture them in the solicitation document, and you must show in the solicitation document how they are going to apply, and then how they are going to be calculated" (EP2).

Other experts shared similar perceptions on the need to enhance the capacity of procuring entities and their officers on how to apply these initiatives for effective implementation in the construction industry. Patil (2017) argues that the effective implementation of the SME oriented public procurement policies largely depends on how implementing officers are prepared to put the policy into practice and perceive the policy objectives to be consistent with other public procurement and organisational objectives. Therefore, procurement officers are crucial in translating the Preferential and Reservation schemes into practice.

6.4.5 Administrative, human, and business-related factors

Administrative, human, and business-related factors are inherent in the operating business environment, whether human or business-related, that affect the effective implementation of ISD initiatives. Experts discussed institutional challenges in the form of administrative, human, and business-related factors. One expert felt that contract management issues at the institutional level were purely administrative because what is required is a strong team to manage the contract effectively to implement the ISD initiatives. The argument advanced is that appointing one person to manage the contract, which is the case in most construction projects, weakens the implementation of the ISD initiatives, as highlighted below:

"....., you can imagine if it is one person managing the contract and is weak, now that takes us to issues of bribery and corruption and if he is just compromised, that is it" (EP5).

Furthermore, business-related factors arise from the 20 per cent subcontracting policy because it is not embedded in the solicitation document and the contract; it remains until after the contract is awarded. One expert argued that it is like forcing a marriage between the subcontractor and the main contractor. It cannot work. Experts indicated that subcontracting works better if parties agree to work together before tendering and contract award. One expert argued, as indicated in the quote below:

"……because it is not part of the solicitation document, subcontracting is brought in after the contract has been awarded. So, someone already has a contract, and then you try to negotiate with them to give some work to the local contractors. We find it very problematic in two ways; first, there is no relationship between that subcontractor and the client because it came after the contract award. Moreover, these subcontractors are usually given terrible deals that make the execution of the contract unsustainable" (EP1).

Additionally, experts revealed that late and non-payment of contractors is also a significant institutional challenge that hinders the implementation of the 20 per cent subcontracting policy. Experts felt that this has also contributed to contractors abandoning works and poor-quality projects. Experts further indicated that funding is a challenge in the construction industry because the industry is financially starved, and ISD initiatives are hit below the belt. Experts argued that the government should not award contracts when there is no money because most of the local contractors are folded and abandoning the works. As a result, this affects the effective implementation of the 20 per cent subcontracting policy. The findings are consistent with Patil (2017), who acknowledges that the challenges in implementing SME oriented procurement policy are exacerbated by weaknesses in an institutional and administrative capacity, particularly for developing countries.

Furthermore, experts indicated that limited finances hamper ISD initiatives to help contractors mobilise on-site and access equipment. For instance, experts observed that funding challenges are critical institutional challenges facing the implementation of Preferential and Reservation schemes (GRZ, 2014).

Moreover, experts revealed that another administrative problem were loopholes in the system. For example, people take advantage of the weaknesses in the institutional systems for self-gratification, hence affecting the effective implementation of the initiatives as indicated in the following quote below:

"……I think we just have administrative tendencies by certain institutions that make themselves vulnerable. Therefore, people who take advantage of that vulnerability are those who know that they are vulnerable. I come to you, and I tell you that a particular minister is interested in this tender, is the one who is pushing this tender, so you need to ensure that we do it this way [Favour, a particular person]. When the minister has no clue, but because you are vulnerable, someone takes advantage of you. Frankly speaking, I think people take advantage of the loopholes they see. I do not blame them; it is human nature" (EP 2).

Finally, experts indicated that human factors affecting the implementation of affecting Preferential and Reservation schemes manifest themselves in a lack of technical know-how and entrepreneurial skills. Experts felt that there are very few entrepreneurs in the construction industry; most people in the construction industry are chancers. These are contractors who just find themselves connected to other people and get contracts then fail to execute them at the end of the day.

6.5 Government support issues

6.5.1 Information dissemination

There was some consensus among experts that information dissemination to locals has been effective, and local contractors are aware of the available ISD initiatives. Some experts shared that information is disseminated to local contractors through websites, trade shows, and workshops, as is indicated in the following excerpt below:

> *"…. yes, information dissemination has been good through our offices. CEEC has also done so much dissemination on various initiatives, on what they are offering. I can confidently say that contractors who have been in operation for three or more years are aware of these initiatives. Perhaps the challenge could be for newcomers who may need more awareness of the various initiatives that are taking place in the construction sector*" (EP9).

However, other experts felt that there were still gaps because the information is dynamic by nature and therefore needed to be updated. This argument is echoed by Harland *et al.* (2019), who highlights how governments in other countries have spent resources in the form of information dissemination advice, websites, and other platforms to support SME businesses. However, Harland *et al.* (2019) observe that most SME businesses perceive more value in direct and indirect financial mechanisms that improve their resource capacity to engage in public contracts than mere information advice. Moreover, even though the information is valuable, if contractors lack the resources and capacity to bid for contracts, the information will not add value to the local contractors.

Furthermore, experts unanimously agreed that there is adequate information dissemination on the Preferential and Reservation schemes. Experts particularly singled out the RDA and NCC as having played a proactive role in disseminating information on various initiatives in the construction industry, as highlighted in the excerpt below:

> *"In terms of information dissemination, there is a strong collaboration with RDA. They have been open to us; we have been interacting and shared several concerns and proposals with RDA. CEEC somehow has not been proactive; we pursue them to get information. They have not been active in that area, maybe in other sectors such as aquaculture and the likes, but*

not in the construction industry. However, we have managed to get information because most of the things are related to RDA, they are connected to RDA's procurement, so through RDA, we can pick one or two things" (EP3).

Nevertheless, experts still felt that more work needed to be done despite the information flowing to the contractors. By nature, information is dynamic, and changes in the institutional environment should be communicated to contractors.

Furthermore, in a study on the implementation of government policy in the supply chains, Harland *et al.* (2019) acknowledge that communication is one of the main gaps between policymakers, implementers, and the target groups of the policy. For example, in the SME access to public procurement study, Loader and Norton (2015) argue that communicating available opportunities to SMEs is critical to ensure their participation in public procurement. However, most SMEs prefer resource support to information or general business advice (Harland *et al.*, 2019). However, preference for resource support rather than information is contrary to many ISD initiatives that focus on information support as the primary government support. Therefore, this is an area that may require aligning with local contractors so that information requirements are consistent with the needs of local contractors.

6.5.2 Monitoring and evaluation systems

One of the significant issues affecting implementing ISD initiatives in the construction industry is the lack of proper monitoring and institutional oversight. Some experts indicated that a lack of monitoring systems and clear institutional oversight is a major barrier to the implementation of ISD initiatives, as indicated in the excerpt below:

"I am not aware of any institution that is monitoring the initiatives to see whether they are being implemented properly or whether local empowerment and technology transfer is being achieved. I am afraid to say there is no record anywhere to show you that this is achieved through the initiatives because the implementation has been haphazard, and that is the problem. One of the reasons is, like I have indicated, lack of modalities for the 20 per cent subcontracting policy" (EP3).

However, other experts argued that statutory bodies such as the NCC and the RDA have the mandate to oversee implementing initiatives in the construction industry. Experts noted that specific roles overlap between institutions such as the NCC and the RDA, creating problems on which institution is responsible for supervising a specific ISD initiative. Furthermore, experts made some proposals on how the implementation of ISD initiatives should be monitored through appropriate

oversight institutions. For example, EP7 suggested that monitoring should be conducted by professional bodies such as the Engineering Institution of Zambia and the Zambia Institute of Purchasing and Supply.

Effective monitoring and evaluation systems of ISD initiatives are critical in ensuring that the implementation of the ISD initiatives is well-coordinated and their impact is well documented. Experts indicated a lack of proper monitoring and evaluation systems in the implementation of Preferential and Reservation schemes. Experts, however, revealed that, ideally, NCC is mandated to provide oversight on implementing ISD initiatives in the construction industry. Additionally, RDA has also been playing a critical oversight role. However, some of the roles overlap with NCC, thus creating problems on which institution should be performing a particular function.

Below is a quote from one expert:

> *"I do not think we have a very dedicated institution that is tracking the progress in terms of the growth direction as a result of these initiatives. You would find some information is sitting in our institution. However, this information is not stored to realise how we have moved from the baseline, for instance, to a certain point in time, as you have said our focus is on implementation"* (EP7).

Similar to monitoring and evaluation under the 20 per cent subcontracting policy, some experts felt that professional bodies must provide oversight in implementing Preferential and Reservation schemes. They argued that to ensure that ISD initiatives are implemented holistically in line with overarching empowerment objectives, professional bodies should provide oversight.

Scholars suggest different interventions to ensure effective systems for monitoring and evaluation of subcontracting policies. For example, Kidalov (2013) recommends on-site reviews of main contractors to ensure compliance with the subcontracting policy without specifying a particular responsible entity. Furthermore, some experts suggested the need for a proper system of subcontractor monitoring through a shared database to know the size of projects and the value of the contracts subcontracted annually. Davis and Brady (2015) echo similar arguments on the need for robust measurement and monitoring of SME oriented public procurement policy implementation as a critical tool of ensuring monitoring of contracts awarded to SMEs. Similarly, Murray (2014) proposes outcome-based evaluations, using reliable baselines, to inform SME oriented public procurement policy development instead of anecdotal evidence.

6.5.3 Training model for contractors

Supplier training is a common type of supplier development in procurement and supply chain management (Krause, 2014). Training or education of employees at the supplier organisation is an essential aspect of KT from the buying organisation to the supplier (Modi and Mabert, 2007). This results in the buying organisation transferring both explicit and tacit knowledge with a view of improving supplier operational performance.

In this vein, the NCC construction school was established to build capacity and regulate the Zambian construction industry. The primary function of the school is to provide training to local contractors (National Council for Construction, 2019). Experts interviewed, however, indicated that the current NCC training model is not responsive to industry needs, and the cost of accessing the training is prohibitive to most local contractors. Furthermore, experts generally felt that there is no connection between NCC training and winning future contracts. Experts argued that NCC was not doing its part because some contractors trained and returned on their register consistently have not won a single public contract for over five years. NCC does not follow up to know how they are applying the skills they learned, as indicated in the quote below:

> *"……..you find a contractor who registers with NCC today is the one who gets a contract. The contractor who has been there for five or even ten years has nothing, no contract, according to them, he is a bad contractor. So, it is chaotic, the arrangement has been chaotic, we have good initiatives if only we have a proper system, we would implement, but without a proper system, I doubt if we see the results. I think that is where we need to work on"* (EP3).

6.5.4 Financing model for contractors

Financial resources are a critical aspect of capacitating contractors. They are widely used in supplier development, where a buying organisation makes a specific investment in the supplier organisation to improve the supplier's operations. Specific investment in the supplier's physical assets or human resources facilitates KT to the supplier (Krause and Scannell, 2002; Wagner, 2010). However, in ISD initiatives, the Construction Finance Initiative is implemented through a third-party arrangement. The government and its quasi-autonomous institutions signed memoranda of understanding with commercial banks and insurance companies to waive specific requirements for local contractors to access finance. Therefore, in the current research, the Construction Finance Initiative is an indirect supplier development activity.

The RDA working with the NRFA, commercial banks, and insurance companies, devised a programme where local contractors would access finance for financing equipment, performance bonds, payment guarantees, and invoice discounting. Expert perceptions of the financing model for

contractors indicate that it has failed to work, and therefore contractors reverted to the traditional financing model.

Experts revealed that the banks were not willing to support this initiative. As a result, the initiative has not yielded any results because banks are not flexible. Experts felt that the Finance Construction Initiative was established to avert the demand for collateral because contractors have no collateral to access finance. Furthermore, experts revealed that some contractors who borrowed from the lending institutions did not understand the terms and conditions, therefore losing all their profits. Moreover, the financing model was not backed by any legal framework as it fell outside the mandate of RDA and NRFA. The lack of a legal framework has, therefore, further hindered the effective implementation of the initiative, as indicated in the following excerpt:

> *"…….RDA and NRFA, on their part, did not have the legal instruments to back them to support these initiatives where they can guarantee that the contractor will pay back. You find that the initiative has not yielded the desired results, and as such, contractors still follow the traditional banking arrangement" (*EP3).

The institutional factors influencing the implementation of ISD are summarised in Figure 6-2 below:

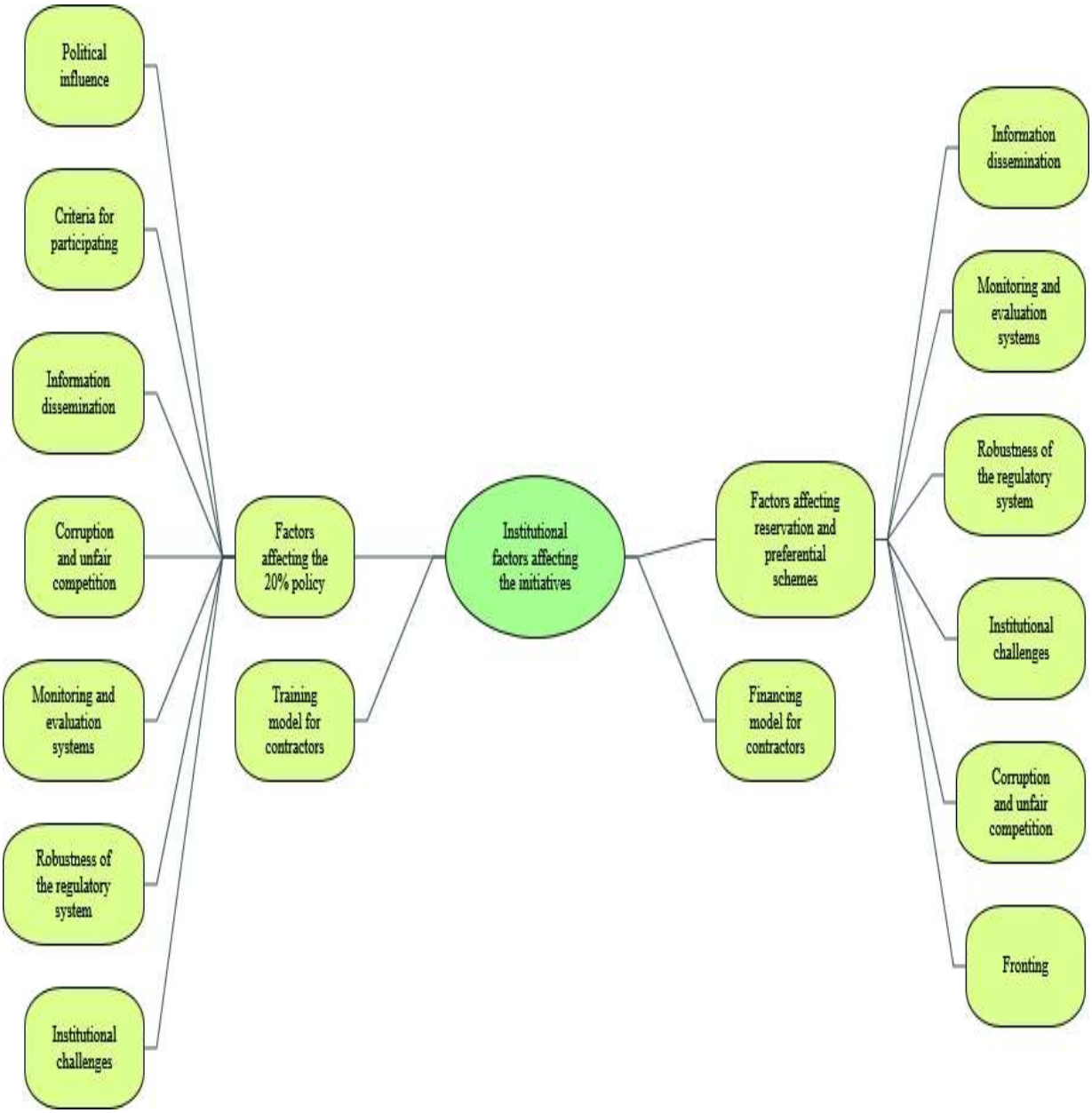


Figure 6-2: Findings on institutional factors influencing ISD initiatives

Source: Researcher (2020)

6.6 Perception of the effectiveness of ISD initiatives

The effectiveness of ISD initiatives was assessed based on the achievement of empowerment objectives and KT to local contractors. Empowerment in this context is developing a sustainable contracting capacity for local contractors to undertake significant construction works. This capacity is assessed through the NCC six-tier contractor grading system. Grade 6 is the entry-level, while

grade 1 is the highest level to access the maximum value contracts. Experts provided their perceptions on the effectiveness of ISD initiatives in terms of helping the government to achieve its empowerment and development objectives. Table 6-2 below summarises experts' perceptions with regards to their assessment of the effectiveness of ISD initiatives.

Table 6-2: Perceptions of the effectiveness of ISD initiatives.

Summary of interview findings		**Expert IDs**									
		EP1	**EP2**	**EP3**	**EP4**	**EP5**	**EP6**	**EP7**	**EP8**	**EP9**	**Total**
How effective are the ISD initiatives in the construction industry in Zambia?											
1	**Effectiveness of the 20 per cent sub. policy**										
	Achievement of empowerment objectives	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
	KT	✓	✓							✓	3
2	**Effectiveness of the Preferential and Reservation schemes**										
	Achievement of empowerment objectives	✓		✓	✓	✓		✓	✓	✓	7
	KT		✓		✓			✓			3
3	**Effectiveness of NCC training model and Construction Finance Initiative**										
	KT		✓	✓						✓	3

Source: Researcher (2020)

Results indicate mixed opinions on the effectiveness of ISD initiatives in the construction industry in Zambia. Some experts (precisely 3 out of 9) acknowledged that the initiatives are working towards the objectives of the government empowerment agenda. However, most experts revealed that the initiatives have not been working effectively because of the various institutional factors outlined above.

Some experts felt that ISD initiatives have been working in terms of KT to local contractors, particularly in the road sector. Contractors who have been involved in projects through a 20 per cent subcontracting policy have been very well skilled through KT. Nevertheless, they acknowledged that some initiatives have not worked to expectations because, for example, the implementation of the 20 per cent subcontracting policy has no legal framework

Furthermore, one expert representing a statutory body revealed that about 1359 local contractors had been attached to main contractors through the 20 per cent subcontracting policy. The following excerpts highlight some expert's opinions on the effectiveness of ISD initiatives.

> *"……. right now, you see that most of the road infrastructure being done around Lusaka and the Copperbelt involves Zambian subcontractors, most of the works they are doing, the paving, the drainages, and things like that. I see what they are doing, and they are doing*

good quality works, which they have learned from the same subcontracting policy initiative. So, there has been a transfer of knowledge there, I have spoken to some of them, and I interact with them quite often, and I think there has been a good level of knowledge transfer" (EP2).

Another expert adds that stakeholders have begun to see some benefit realised by some contractors as a result of the 20 per cent subcontracting policy. Although they were quick to mention that there is still room for improvement, as highlighted in the following quote:

"I think in the current state, I would say yes they are working, and we are trying to increase the scope of work, not necessarily focusing on the minor works but also the major scope of work. For instance, I would give you an example of the decongestion project [Lusaka decongestion project]; instead of them focusing on doing road marking and signs, they are now working on actual portions of roads. Hence, there is knowledge transfer where you are given a stretch of a kilometre as a local contractor to work on it, especially on the Lusaka decongestion project" (EP6).

Furthermore, some experts revealed that when the local contractors benefit from the initiatives, what happens in terms of performance depends on them; therefore, some local contractors succeed, and others have challenges. Some experts felt that the government was meeting its development agenda and that there were success stories recorded in the implementation of the initiatives, as indicated in the following excerpt:

"There are people who can attest that had it not been for government coming up with these deliberate measures [ISD initiatives], they do not know how they would have penetrated the market" (EP7).

However, some experts felt that the ISD initiatives had not achieved the empowerment and development objectives in the current state. Some argued that it is hard to evaluate ISD initiatives because there are no set targets and milestones. Moreover, there are no criteria one can use to measure if the initiatives have succeeded or not. Experts felt that there had not been a needs assessment of local contractors, which is the basis for implementing any capacity development initiatives. As a result, the contractor upgrade has not been successful because the basics, such as the needs assessment, are not there as outlined below:

"The basis and structure [Contract training needs assessment] have not been well thought out; hence it is not helping the government. So, for me, in a nutshell, they are not working; they need to be reviewed" (EP7).

Another responded adds:

> *"Currently, I cannot say it has helped [Achieved empowerment objectives] because I cannot point at the contractor, who has grown through the 20 per cent subcontracting policy or other initiatives. All I hear are complaints, but when people are getting benefits like payments from these projects, no one comes to tell us that they have been paid. So, it is chaotic, the arrangement has been chaotic, we have good initiatives, if only we have a proper system, we would implement, but without a proper system, I doubt if we will see the results. I think that is where we need to work on"* (EP3).

Arising from the above findings, experts proposed some strategies to improve the current implementation of ISD initiatives. Among the prominent suggestion is the possibility of encouraging joint ventures between large foreign contractors and local contractors. Experts felt that this would enhance the interaction between the parties, which can create a fertile ground for KT. Experts felt that on the implementation side, joint ventures should be encouraged, as highlighted in the following quote:

> *"I think we need to go and look at the Zambia Public Procurement Act No 12 of 2008 and see that part which talks about the need to form joint ventures. Subcontracting is neither here nor there, even in terms of skills transfer; subcontracting is not as much as a joint venture would do."* (EP1).

On the 20 per cent subcontracting policy, experts felt that the subcontractor should be engaged right from the beginning of the tendering process. These subcontractors should be paid directly by the client after they have submitted their payment documents. In this way, KT will be more effective than where the main contractor has to pick the subcontractor after the award of the contract.

Furthermore, experts also indicated that to enhance the management of subcontractors, there is a need to cluster contractors together. Experts felt that one of the challenges in implementing the 20 per cent subcontracting policy is the administrative burden on the main contractor of managing, for example, 40 subcontractors on site. If there is a supervising engineer, he must also inadvertently supervise the subcontractors, thereby increasing the administrative work. Supervision, therefore, increases the operational burden on the main contractor, as indicated in the following excerpt by one of the experts from a statutory body responsible for implementing the initiatives in the road construction industry:

"……because one of the complaints from the main contractors has been that how do you expect me to supervise a hundred companies because the threshold of what they can [manage] based on the NCC guidelines; a grade 6 contractor can only do so much or so little. So, to attain 20 per cent, you need hundreds of them, which company will give them a supervisor to supervise all of them without making a construction site look like a football pitch. So, as an agency, we are trying to upgrade the quality of the subcontracting through clustering or joint ventures" (EP8).

6.7 Chapter summary

The chapter has presented the main qualitative findings of the study from nine expert interviews conducted to identify the institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. The chapter reveals that the 20 per cent subcontracting policy implementation is currently subjected to strong political influence and that corruption has also contributed to unfair competition between local and foreign contractors. Besides, the lack of a regulatory framework to guide the 20 per cent subcontracting policy implementation has affected its implementation adversely.

The findings also reveal that implementation of the Preferential and Reservation schemes are affected by institutional factors akin to the 20 per cent subcontracting policy except fronting which is more prominent in the Preferential and Reservation schemes. Furthermore, the chapter also reveals that the NCC training and the Construction Finance Initiative have not responded adequately to the needs of local contractors. For example, it is evident from the findings that the current NCC training is not linked to winning future contracts to demonstrate the effectiveness of KT.

Interestingly, there is consensus among experts that the initiatives, particularly the 20 per cent subcontracting policy, have contributed to the empowerment objectives. The findings show that more local contractors are given a significant scope of work. Furthermore, information dissemination has been effective and that local contractors are aware of these initiatives.

The following chapter focuses on the quantitative study from the questionnaire responses of 171 local contractors in the construction industry. The quantitative study addresses the four research objectives and tests the hypotheses proposed in the conceptual framework in chapters 1 and 4. Specifically, the chapter will examine how and which ISD initiatives are associated with KT. Furthermore, the chapter will examine the effectiveness of KT on the operational performance of local contractors in the construction industry in Zambia. Moreover, the chapter investigates the mediating role of AC on the relationship between KT and operational performance and how institutional factors moderate the relationship between ISD initiatives and KT.

CHAPTER 7

QUANTITATIVE DATA ANALYSIS

7.1 Introduction

The present chapter outlines the findings from the quantitative study of 171 construction companies in the Lusaka and Copperbelt provinces of Zambia. The chapter establishes which ISD initiatives are associated with KT. Furthermore, the chapter examines the effect of KT on the operational performance of local contractors in the construction industry. Additionally, the chapter investigates the mediating role of AC on the relationship between KT and the operational performance of local contractors and the moderating effect of institutional factors on the relationship between ISD initiatives and KT.

The current chapter sets out the characteristics of the sample in section 7.2. Section 7.3 outlines the demographic profile of respondents. Section 7.4 presents descriptive statistics on the participation of local contractors in ISD initiatives and the support they need. Section 7.5 presents the results of the correlation analysis, followed by the hierarchical regression analysis, mediation, and moderation analyses in sections 7.6, 7.7, and 7.8, respectively. Section 7.9 concludes with a summary of the chapter.

7.2 Sample characteristics

The population for the current research consists of registered contractors under the NCC from 2017 to 2019, and the sampling frame consists of 1649 contractors from Lusaka and Copperbelt provinces (National Council for Construction, 2019). The sampling frame represents 57 per cent of all registered contractors in Zambia. Four categories (B, C, R, and ME) comprises the core construction activities. These are general construction and housing (B), general civil engineering (C), general road and earthworks (R), and mechanical engineering works (ME).

The unit of analysis in this research study is the local construction company represented by a senior member or owner as a respondent. Respondents were requested to give their perception of which ISD initiatives contribute to KT and, subsequently, operational performance improvements. The respondent was asked to refer to a specific relationship between the main contractor or construction project, which they executed through the Preferential scheme, Reservation scheme, training, or access to finance within the last three years.

A total of 176 questionnaires from both the Lusaka and Copperbelt provinces were collected. Five of the questionnaires were incomplete because vital information was missing, and therefore, the questionnaires were discarded. The total response rate is 28.3 per cent. The response rate of 171 comprises 89 (52 per cent) from Lusaka and 82 (48 per cent) from the Copperbelt provinces, respectively, as indicated in Table 7-1.

Table 7-1: Survey overall response rate

Location	Frequency (n)	Percentage	Response rate
Lusaka	89	52	28.3 per cent
Copperbelt	82	48	
Total	171	100	

Source: Researcher (2020)

7.3 Demographic profile of respondents

Demographic information shows that the average years of operation of the surveyed construction companies was 8.3 years. The company age was measured by the number of years in operation at the end of February 2020. Moreover, the industry is dominated by 148 (86.5 per cent) males compared to 23 (13.5 per cent) females. The number of employees was a proxy measure of the company size (rated by the number of employees on a 4-point scale, for example, 1: below 25; 2: 26 to 50; 3: 51-75 and 4: above 76 employees).

The majority of 119 companies (69.6 per cent) have fewer than 25 employees, and only 12 (7 per cent) have more than 76 employees. Furthermore, most respondents, 88 (51.5 per cent), have college Diplomas, and the majority of companies, 92 (53.8 per cent), are registered in Category B-General Building and Housing. Moreover, most companies, 77 (45 per cent), were registered at the lowest level, Grade 6, and, in terms of ownership, 116 (67.8 per cent), were private limited companies. Table 7-2 summarises the demographic profile of respondents.

Table 7-2 Demographic profile of respondents

Respondent profile			
Years in operation (Company age)	Mean	8.3	
	Standard deviation	5.8	
	Minimum years in operations	3	
	Maximum years in operations	36	
		Frequency (n)	**Percentage**
Gender	Female	23	13.5
	Male	148	86.5
Number of employees	Below 25	119	69.6
	26 to 50	30	17.5
	51 to 75	10	5.8
	76 and above	12	7
Position of respondent	Owner	68	39.8
	CEO/Director/Senior manager	75	43.9
	Others	28	26.4
Tenure of respondent	1 year and below	0	0
	2 to 4 years	56	32.7
	5 to 7 years	41	24
	7 to 9 years	23	13.5
	over 10 years	51	29.8
Qualification	Primary certificate	6	3.5
	Secondary certificate	19	11.1
	College Diploma	88	51.5
	Degree	52	30.4
	Others	6	3.5
Category/subsector	Category B-General Building and Housing	92	53.8
	Category C-General Civil Engineering Works	33	19.3
	Category R-General Roads and Earth Works	32	18.7
	Category ME-Mechanical Engineering Works	10	5.8
	Other construction works	4	2.3
NCC grade	Grade 3	18	10.5
	Grade 4	23	13.5
	Grade 5	53	31
	Grade 6	77	45
Company ownership	Sole trader	28	16.4
	Family business	10	5.8
	Partnership	17	9.9
	Private limited	116	67.8

Source: Researcher (2020)

7.4 Descriptive statistics

7.4.1 Type of support need by local contractors

Descriptive statistics in Table 7-3 reveal that local contractors still need support in several areas. These include support to improve communication and marketing strategy (reaching out to new projects or contracts), access to finance, training for employees, technological and engineering support, and support to improve quality. All the types of support had a mean score above the average of 2.5, which indicate that the support is needed is essential.

Table 7-3: Type of support needed by local contractors

	N	Minimum	Maximum	Mean	Std. Deviation
Support to improve quality	171	1.000	5.000	3.68421	1.229413
Technological and engineering support	171	1.000	5.000	3.96491	1.078642
Access to finance	171	1.000	5.000	4.23392	1.013565
Training for employees	171	1.000	5.000	3.92398	1.005899
Support to improve communication and marketing strategy (reaching out to new projects or contracts)	171	1.000	5.000	4.02924	1.025710
Valid N (listwise)	171				

7.4.2 Normality tests

The study used descriptive and plots to test for normality tests (see appendix VI). Field (2009) proposes a range of ±2 for skewness and kurtosis indices as acceptable limits. Table 7-4 summarises the results and indicates that all variables were within range for skewness. However, knowledge acquisition, transformation and operational performance were slightly above the prescribed ranges. Besides, an inspection of plots indicates that overall, the variables were within the acceptable range of normal distribution and the sample of 171 local contractors was sufficient.

Table 7-4 Descriptive statistics-normality tests

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Subcontracting	171	1.00	5.00	2.7825	1.07437	-.106	.186	-1.072	.369
Reservation	171	1.00	5.00	2.7942	1.03297	.112	.186	-.786	.369
Preferential	171	1.00	5.00	2.7222	1.03910	-.028	.186	-.681	.369
Training	171	1.00	5.00	3.1915	1.06596	-.609	.186	-.341	.369
Construction fin.	171	1.00	5.00	1.7719	.98184	1.269	.186	1.090	.369
Acquisition	171	1.00	5.00	3.9084	.76358	-1.360	.186	3.333	.369
Assimilation	171	1.00	5.00	3.8908	.70185	-.719	.186	1.306	.369
Transformation	171	1.00	5.00	4.0886	.65045	-1.293	.186	3.257	.369
Application	171	1.00	5.00	3.5819	.78909	-.713	.186	.932	.369
Regulatory comp.	171	1.00	5.00	2.4351	1.04225	.456	.186	-.441	.369
Government sup.	171	1.00	5.00	2.6404	.92277	-.043	.186	-.412	.369
Knowledge transf.	171	1.00	5.00	3.4279	1.00310	-.607	.186	-.065	.369
Performance	171	1.00	5.00	4.1793	.75277	-1.437	.186	2.628	.369

Note: Variables are the 20 per cent subcontracting policy, Reservation and Preferential schemes, NCC training, Construction Finance Initiative, knowledge acquisition, assimilation, transformation, application, regulatory compliance, government support and operational performance

7.5 Correlation analysis

Table 7-5 presents the correlations, means and standard deviations of the dependent variables (KT and operational performance), independent and intermediary variables (the 20 per cent subcontracting policy, Preferential scheme, Reservation scheme, NCC training, construction finance, AC, regulatory compliance, and government support). Lastly, control variables (company age and the number of employees).

First, the two control variables were not significantly correlated with KT (r= -.004 to .148). Second, the 20 per cent subcontracting policy, NCC training, and government support were significantly correlated with KT (r=.226 to .419, p<.01). However, the Preferential scheme, Reservation scheme, Construction Finance Initiative, and regulatory compliance were not significantly correlated with KT.

Third, the multidimensional constructs of AC, knowledge acquisition, assimilation, transformation, and application were all significantly correlated with KT (r=.176, p<.05 to .273, p<.01) and with operational performance (r=.355 to .560, p<.01). KT also correlated significantly with operational performance (r=.292, p<.01).

Furthermore, intercorrelations among independent variables were relatively moderate (r values were less than .80). Therefore, multicollinearity is not a problem (Hair *et al.*, 2014). Multicollinearity is usually a problem if intercorrelations among independent variables are more than .90 (Tabachnick and Fidell, 2007; Field, 2009; Hair *et al.*, 2014). In general, the results of correlations suggest a strong relationship between variables in the relationship between some ISD initiatives, government support, AC, KT, and operational performance. The data is, therefore, suitable for further analysis using hierarchical multiple regression, mediation, and moderation analyses.

Table 7-5: Correlations among variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Company_age	8.322	5.753														
No_of_employees	1.503	0.890	.174*													
Subcon	2.782	1.074	-.077	.148												
Reserv	2.794	1.033	-.012	.035	.537**											
Prefere	2.722	1.039	.126	.241**	.220**	.179*										
NCC_train	3.192	1.066	.031	.056	.102	.148	.192*									
Const_fin	1.772	0.982	.151*	.143	.420**	.349**	.176*	.130								
Regu_comp	2.435	1.042	.140	.048	.388**	.427**	.041	.055	.369**							
Gov_supp	2.640	0.923	-.004	.096	.439**	.504**	.126	.301**	.333**	.519**						
K_acqui	3.908	0.764	-.066	.031	.002	-.083	.052	.099	-.089	-.100	-.004					
K_assim	3.891	0.702	-.115	.151*	.161*	.126	.099	.069	-.014	-.010	-.026	.395**				
K_trafm	4.089	0.650	-.102	.043	.003	.026	.057	.068	-.132	-.084	-.012	.523**	.562**			
K_appl	3.582	0.789	.015	.144	.334**	.217**	.180*	.142	.087	.185*	.209**	.462**	.530**	.483**		
K_transfer	3.428	1.003	-.050	.109	.226**	.112	.132	.419**	.073	.112	.273**	.176*	.203**	.253**	.266**	
Perform	4.179	0.753	-.004	.148	.127	.138	-.006	.089	-.053	-.037	.026	.355**	.431**	.560**	.394**	.292**

*. Correlation is significant at the 0.05 level (2-tailed).

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

AC is a multidimensional construct of knowledge acquisition, assimilation, transformation and application. Mean, average score for all of the items included in this measure; SD, standard deviation; Subcon- 20 per cent subcontracting policy; Reserv-Reservation scheme; Prefere-Preferential scheme; NCC_train-NCC training; Const_fin-Construction finance initiative; Regu_comp-Regulatory compliance, Gov_supp-Government support, K_transfer-knowledge transfer and Perform-operational performance

Source: Researcher (2020)

7.6 Hierarchical multiple regression analysis

7.6.1 Preliminary tests

First-line tests were carried out to determine whether the hierarchical multiple regression model could be used for the study and to ensure the validity of the data. In the first place, the sample size of 171 was considered adequate because it was above the typical minimum sample size from

related studies in the field (Lawson, Krause and Potter, 2015; Benton, Prahinski and Fan, 2020). Tabachnick and Fidell (2007, p.123) recommend a sample size based on the number of independent variables for a regression equation. For example, to conduct bivariate and multivariate analysis, a 50+8m formula is used, where m is the number of independent variables (in this study, with five independent variables, we have 50+8x5= 90). Therefore, a sample size of 171 is sufficient to proceed with the hierarchical multiple regression analysis.

Furthermore, multicollinearity was tested again using the variance inflation factor (VIF), as indicated in Table 7-6. Multicollinearity exists when there is a strong correlation (ideally above .9) in the regression model among independent variables. Collinearity between independent variables increases sampling variance in estimates of their partial relationships with a dependent variable that, in turn, propagates through further estimates and increases the p-value (Hair *et al.*, 2014). Table 7-6 also confirms that multicollinearity is not a problem because the VIF values are all less than 5 (Hair *et al.*, 2014). The VIF of above 10 is considered undesirable (Field, 2009, Hair *et al.*, 2014). Table 7-6 also shows tolerance, which is a reciprocal of VIF.

7.6.2 Second tests

In order to address objective 1: *to establish which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT,* the study used hierarchical multiple regression analysis. First, hierarchical multiple regression analysis was performed using control variables (company age and number of employees) to assess their effect. The second hierarchical multiple regression was done with a new set of independent variables together with the first step of control variables (company age, number of employees, 20 per cent subcontracting policy, Reservation scheme, Preferential scheme, NCC training, and Construction Finance Initiative). Table 7-6 summarises the hierarchical multiple regression on the relationship between ISD initiatives and KT, which indicates the estimates of the contributions of the independent variables to the dependent variable.

Table 7-6: Summary of hierarchical multiple regression of ISD initiatives and KT

Dependent variable: KT

	Model 1		Model 2		Collinearity statistics	
Control variables	**B**	**SE**	**B**	**SE**	**Tolerance**	**VIF**
Company age	-.012	.014	-.009	.013	.916	1.092
No of employees	.137	.088	.078	.082	.900	1.111
Independent variables						
Subcontracting policy			.205*	.082	.617	1.622
Reservation scheme			-.050	.081	.681	1.468
Preferential scheme			.015	.072	.866	1.154
NCC training			.383***	.067	.945	1.058
Construction finance			-.059	.081	.762	1.312
R	.130		.471			
R Square	.017		.222			
Adjusted R Square	.005		.189			
R Square Change	.017		.205			
F	1.436		6.643***			
F Change	1.436		8.596***			

***Significant at p < 0.001; **Significant at p < 0.01; *Significant at p < 0.05;
VIF = Variance Inflation factor.

Source: Researcher (2020)

A two-stage hierarchical multiple regression was conducted to examine the relationship between the set of independent variables (the 20 per cent subcontracting policy, Reservation scheme, Preferential scheme, NCC training, and Construction Finance Initiative) against the dependent variable KT. The analysis was after controlling for the effects of company age and the number of employees.

Model 1 shows the base model with control variables, company age, and the number of employees as predictors of KT. Model 1 was not statistically significant (F (2,168) = 1.436; p=.241) and explained about 1.7 per cent of the variance in KT. The results indicate that company age and number of employees are not significantly associated with KT.

Model 2 has seven predictor variables (company age, number of employees, the 20 per cent subcontracting policy, Reservation scheme, Preferential scheme, NCC training, and Construction Finance Initiative). The model showed a significant improvement over model 1. The total variance explained in model 2 as a whole was 22.2 per cent (F (7, 163) = 6.643; p < .001). The introduction of the independent variables explained an additional 20.5 per cent of the variance (R square

change=.205) in KT. In model 2, two out of seven variables were statistically significant. NCC training recording a highest value (B=.383, SE=.067; $p < .001$), followed by the 20 per cent subcontracting policy (B=.205, SE=.082; $p < .05$).

The results indicate that NCC training and 20 per cent subcontracting policy are positively and significantly associated with KT. However, results also show that the Preferential scheme, Reservation scheme, and Construction Finance Initiative are not significantly associated with KT. In sum, the results reveal that only two ISD initiatives (NCC training and the 20 per cent subcontracting policy) are positively and significantly associated with KT. Therefore, objective 1, which sought to establish which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT, has been addressed.

7.7 Theory of mediation analysis

Mediation analysis has become very popular in management and business research because it helps researchers understand how, or by what means, effects unfold (Preacher and Kelley, 2011). Hayes (2018) argues that mediation analysis is designed to test how an independent variable *X* affect the dependent variable *Y* through a third variable *M*. Figure 7-1 depicts three relationships. For example, the top part represents the indirect effect of X on Y through M and the direct effect of X on Y after controlling for M. The bottom part represents the total effect of X on Y (Preacher and Kelley, 2011).

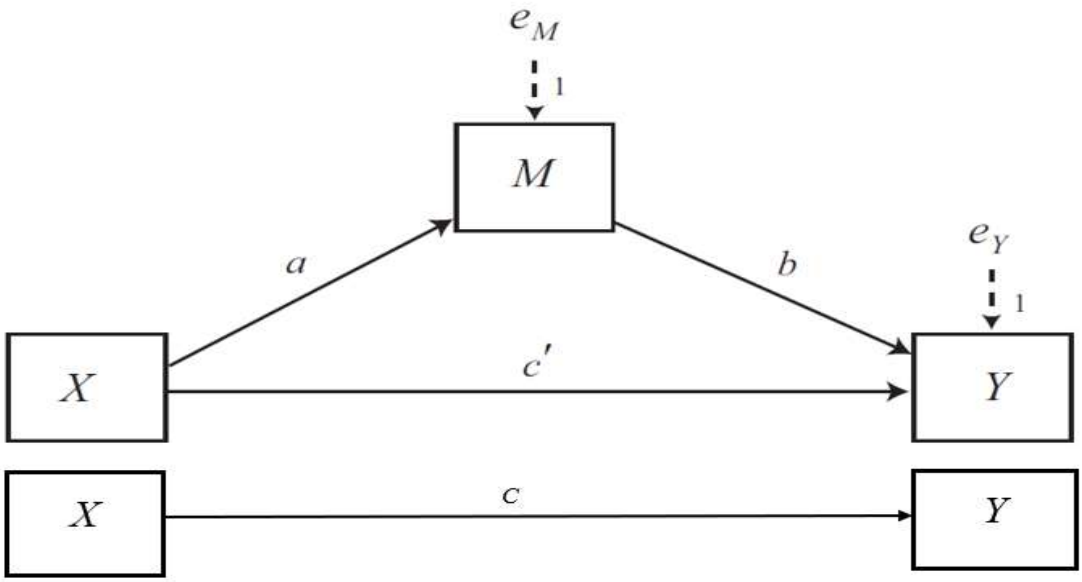
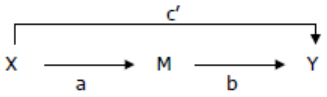


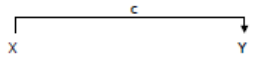
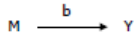
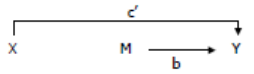
Figure 7-1: A mediation model

Source: Preacher and Kelley (2011) and Hayes (2018)

The most widely used method of assessing mediation is the causal steps outlined in Baron and Kenny's classic work (Baron and Kenny, 1986). Baron and Kenny (1986) proposed a four-step causal steps approach in which a number of regression analyses are conducted, and the significance of the coefficients is examined at each step. Table 7-7 below shows the four causal steps in conducting mediation analysis initiation proposed by Baron and Kenny (1986) and subsequently discussed by other researchers such as Hayes (2018).

Table 7-7: Steps in mediation analysis



	Analysis	*Visual Depiction*
Step 1	Conduct a simple regression analysis with X predicting Y to test for path *c* alone, $Y = B_0 + B_1X + e$	
Step 2	Conduct a simple regression analysis with X predicting M to test for path *a*, $M = B_0 + B_1X + e$.	
Step 3	Conduct a simple regression analysis with M predicting Y to test the significance of path *b* alone, $Y = B_0 + B_1M + e$.	
Step 4	Conduct a multiple regression analysis with X and M predicting Y, $Y = B_0 + B_1X + B_2M + e$	

Source: Baron and Kenny (1986); Hayes (2018)

7.7.1 Mediation procedure

Baron and Kenny (1986) argue that Steps 1-3 were structured to establish a zero-order relationship between variables. If one or more of these relationships are not statistically significant, researchers typically conclude that mediation is not likely to occur. However, this school of thought is slowly losing ground to the second school of thought. The second school of thought argues that there does not necessarily have to be a significant relationship between the independent and dependent variables. Just as correlation does not prove or disprove causation (Mackinnon, Fairchild and Fritz, 2007; Hayes, 2018).

Furthermore, if statistically significant relationships exist between Steps 1, 2, and 3, one can then proceed to Step 4. In Step 4, some form of mediation is supported if the effect of M (path b) remains statistically significant after controlling for X. If X is no longer significant when M is controlled, the finding will support full mediation. If X is still significant (i.e., both X and M predict Y significantly), the finding supports partial mediation (Baron and Kenny, 1986). The recommended mediation test assesses the statistical significance of the relationship between X and M, *a* pathway,

and then the relationship between M and Y, *b*, pathway. There is evidence of mediation if both are statistically significant (Mackinnon, Fairchild and Fritz, 2007).

However, Hayes (2018) critiques the use of the degree of mediation (full or partial) because complete or partial mediation is defined only when a researcher has determined that the total effect is significantly different from zero. Rucker *et al.* (2011) caution against the simplistic approach of complete or partial mediation because complete mediation implies that M completely mediates the effect of X on Y and nothing whatsoever about the existence or absence of other possible mediators of X's effect. Mackinnon, Fairchild and Fritz (2007) argue that it is not practical to expect a single mediator to be fully explained by an independent variable to a dependent variable relation. Furthermore, Rucker *et al.* (2011) argue that overemphasis on the evidence of full mediation, for example, would likely discourage researchers from examining other (theoretically significant) indirect effects in the model. Therefore, claims of full mediation can unduly constrain the development of theory, especially when additional mediating paths may exist. Therefore, the current study focuses on testing for the existence or nonexistence of mediation caused by AC in the relationship between KT and operational performance.

7.7.2 Mediation using Bootstrapping procedure

Preacher and Hayes (2004) argue that Baron and Kenny's (1986) mediation analysis suffers from many shortcomings. Firstly, the procedure by Baron and Kenny (1986) does not address the significance of *ab* directly; instead, it applies a series of separate significance tests not directly involving *ab*. Second, their procedure suffers from low statistical power in most situations because of the requirement that both the *a* and *b* coefficients be statistically significant. Third, the concept of partial and full mediation has been repudiated in recent studies. These shortcomings have led to the proliferation of the bootstrapping procedure in testing for mediation analysis using PROCESS Macro.

Bootstrapping procedure requires only two conditions; first, there should exist an effect to be mediated, that is, $c \neq 0$ and second, that the indirect effect is statistically significant in the direction predicted by the mediation hypothesis. Therefore, the bootstrapping procedure for mediation analysis is more robust, as recent studies indicate (Preacher and Hayes, 2004; Preacher and Kelley, 2011; Hayes, 2018) and based on the same line of thought, bootstrapping procedure for mediation analysis is applied in the current research study.

Furthermore, when using the bootstrapping procedure, the indirect effects are significant if the bootstrap confidence interval is statistically different from zero. If the interval for the indirect effect is statistically significant, it entails that the range of the confidence interval does not include zero. However, the test is not statistically significant if the confidence interval straddles zero for the

indirect effect. Williams and Mackinnon (2008) argue that bootstrap confidence intervals are a better approach to inference when the original data is available for analysis. There are no assumptions about the shape of the $a_i b_i$ sampling distribution, and bootstrap confidence intervals tend to be more potent than competing methods, such as the normal theory approach.

7.7.3 Testing for mediation in the model

The research study used mediation analysis in order to test for the direct and indirect effects of AC as a multidimensional construct on the relationship between KT and the operational performance of local contractors. A 95 per cent bootstrap confidence interval with 5,000 bootstrap samples was applied using PROCESS Macro model 4 (Hayes, 2018). When using this procedure, indirect effects are significant if the bootstrap confidence interval is statistically different from zero, that is, if the range of the confidence interval does not include zero (Preacher and Hayes, 2004; Preacher and Kelley, 2011; Hayes, 2018). Below is a summary of output from the SPSS PROCESS Macro for testing the mediating effect of AC as a multidimensional construct on the relationship between KT and the operational performance.

Table 7-8: Summary of direct and indirect effects KT-AC-operational performance

Paths for AC multidimensional constructs	**b**	**SE**	**t**	**p**
K-transf→ Perform (c)	.220 [.110, .328]	.055	3.970	P<.001
K-transf → *Acquisition* (a_1)	.134 [.021, .248]	.058	2.331	P<.05
K-transf → *Assimilation* (a_2)	.142 [.038, .246]	.053	2.698	P<.01
K-transf → *Transformation*(a_3)	.164 [.069, .259]	.048	3.394	P<.001
K-transf → *Application*(a_4)	.209 [.094, .324]	.058	3.584	P<.001
Acquisition → Perform (b_1)	.036 [-.113, .184]	.075	.476	P=.635
Assimilation → Perform(b_2)	.130 [-.041, .300]	.087	1.500	P=.136
Transformation → Perform (b_3)	.460 [.269, .651]	.097	4.761	P<.001
Application → Perform(b_4)	.080 [-.069, .230]	.076	1.060	P=.291
K-transf→ Perform (c')	.104 [.007, .201]	.049	2.119	P<.05
Indirect effects of X on Y	**Effect (ab)**	**Bootstrap SE**	**Bootstrap Lower limit 95per cent CI**	**Bootstrap Upper limit 95per cent CI**
K-transf → *Acquisition* → Perform (ab_1)	.0048	.0154	-.0225	.0420
K-transf → *Assimilation* → Perform (ab_2)	.0184	.0171	-.0080	.0589
K-transf→ *Transformation* → Perform (ab_3)	.0754	.0370	.0166	.1595
K-transf → *Application* → Perform (ab_4)	.0168	.0174	-.0148	.0552
AC (ab_{total})	**.1154**	**.0473**	**.0352**	**.2206**

Note: K-transf -KT; Perform- operational performance and AC dimensions (knowledge acquisition, assimilation, transformation, and application)

Table 7-8 addresses objectives 2 and 3, which *are to examine the effect of KT on operational performance and to investigate the mediating role of AC on the relationship between KT and operational performance*, respectively. With regards to objective 2, the results show that there is a significant positive relationship between KT and the operational performance of local contractors (K-transf→ Perform (c), b= .220, t=3.970, P< .001). The results entail that KT has a positive and significant effect on the operational performance of local contractors in the construction industry in Zambia. Therefore, objective 2, which sought to examine the effect of KT on operational performance, has been addressed.

Furthermore, the hypothesised relationship that KT has a positive influence on local contractors' AC was significant for all the AC multidimensional constructs. K-transf → *Acquisition*

(a_1) b= .134, t=2.331, p<.05; K-transf → $Assimilation$ (a_2) b=.142, t= 2.698, p< .01; K-transf → $Transformation$(a_3) b= .164, t= 3.394, p< .001 and K-transf → $Application$(a_4) b= .209,. t=3.584, p<.001. The results indicate that there is a statistically significant positive relationship between KT and the AC multidimensional constructs.

The hypothesised relationship that AC has a positive effect on the operational performance of local contractors presented varied results for the AC multidimensional constructs. For example, $Acquisition$ → Perform (b_1) b=.026, t=.476, p= .635; $Assimilation$ → Perform(b_2) b=.130, t=1.500, p=.136 and $Application$ → Perform(b_4) b= .080, t=1.060, p=.291 were not statistically significant. The results indicate that the following AC dimensions, knowledge acquisition, assimilation, and application, do not significantly affect the operational performance of local contractors.

However, $Transformation$ → Perform (b_3) b= .460, t=4.761, p< .001 indicates a statistically significant and positive effect on the operational performance of local contractors. In sum, knowledge transformation, a dimension of AC, has a significant and positive effect on the operational performance of local contractors.

The hypothesised relationship that AC mediates the relationship between KT and the operational performance of local contractors showed mixed results on the different AC multidimensional constructs. For example, K-transf → $Acquisition$ → Perform (ab_1), the indirect effect was not statistically different from zero (ab_1 = .0048, with a 95 per cent bootstrap confidence interval (CI) from -.0225 to .0420); K-transf → $Assimilation$ → Perform (ab_2), the indirect effect was not statistically different from zero (ab = .0184, with a 95 per cent bootstrap CI from -.0080 to .0589) and K-transf → $Acquisition$ → Perform (ab_4), the indirect effect was not statistically different from zero (ab = .0168, with a 95 per cent bootstrap CI from -.0148 to .0552). The results entail that the AC dimensions, knowledge acquisition, assimilation and application do not significantly mediate the relationship between KT and the operational performance of local contractors in the construction industry.

However, for K-transf → $Transformation$ → Perform (ab_3), the indirect effect was statistically different from zero (ab = .0754, with a 95 per cent bootstrap CI from .0166 to .1595) and K-transf → AC → Perform (ab_{total}), the indirect effect was statistically different from zero (ab_{total} = .1154, with a 95 per cent bootstrap CI from .0352 to .2206). The results reveal that knowledge transformation construct and overall AC mediates the relationship between KT and the operational performance of contractors in the construction industry in Zambia.

Overall, the effect of KT on performance diminished when the mediator AC_{total} is included in the conceptual framework (K-transf→ Perform (c) b= .220, t=3.970, p<.001 compared to K-transf→ Perform (c') b= .104, t=2.119, p< .05 without the mediator variable AC). Since the effect of KT on operational performance dissipate when overall AC is added to the conceptual framework, the result entails that KT alone is not sufficient to improve the operational performance of local contractors. The results support the hypothesis that AC_{total} mediates the relationship between KT and the operational performance of local contractors.

The above results address the third objective of the study, which is *to investigate the mediating role of AC on the relationship between KT and operational performance*. The results show that overall, AC has a significant mediating effect on the relationship between KT and the operational performance of local contractors. Furthermore, the results also clarify the limited knowledge of how the dimensions of AC individually mediate the relationship between KT and operational performance. The results show that the dimensions of AC individually have a varying mediating effect on the relationship between KT and the operational performance of local contractors. The results show that knowledge acquisition, assimilation, and application have no significant mediation effect in the current research. In contrast, knowledge transformation has a significant mediating effect on the relationship between KT and the operational performance of local contractors.

7.8 Moderation analysis

The moderation role of institutional factors, namely regulatory compliance, and government support on the relationship between ISD initiatives and KT, was investigated using PROCESS Macro model 2. Model 2 was selected because there were two moderating variables, namely, regulatory compliance (W) and government support (Z). Moderation analysis focusses on objective 4, which is *to investigate the moderating role of institutional factors on the relationship between ISD initiatives and KT.* Moderation helps practitioners to address intriguing questions such as 'how can regulatory compliance issues be aligned with the ISD initiatives to stimulate KT and contractor operational performance in the construction industry? How can government support influence KT from ISD initiatives and contractor performance improvement in the construction industry? The results of moderation analysis are summarised in the following Tables *for statistically significant moderation effects only.*

7.8.1 Moderation role of regulatory compliance on Preferential scheme and KT

The moderation effect of regulatory compliance on the relationship between the Preferential scheme and KT was statistically significant, b= -.134, 95 per cent CI (-.264, -.005), t= -

2.045, p<.05. The results indicate that the relationship between the Preferential scheme and KT is moderated by regulatory compliance.

Table 7-9 Moderation between Preferential X regulatory compliance

	b	SE (B)	t	p
Constant	1.829 [.709, 2.949]	.567	3.223	P<.01
Preferential	.469 [.095, .843]	.189	2.477	P<.05
Regulatory compliance	.480 [.097, .863]	.194	2.474	P<.05
Preferential X regulatory compliance	-.134 [-.264, -.005]	.066	-2.045	P<.05
Company age	-.012 [-.039, .016]	.014	-.837	P=.404
Number of employees	.097 [-.077, .272]	.088	1.102	P=.272

Note: Preferential-Preferential scheme

Source: Researcher (2020)

7.8.2 Visualising interactions: Preferential X regulatory compliance

Plotting the interactions is necessary for interpreting the significant interaction effects among variables. Figure 7-2 shows the interaction effect of the moderator variable plotted at 15th, 50th, and 84th percentiles.

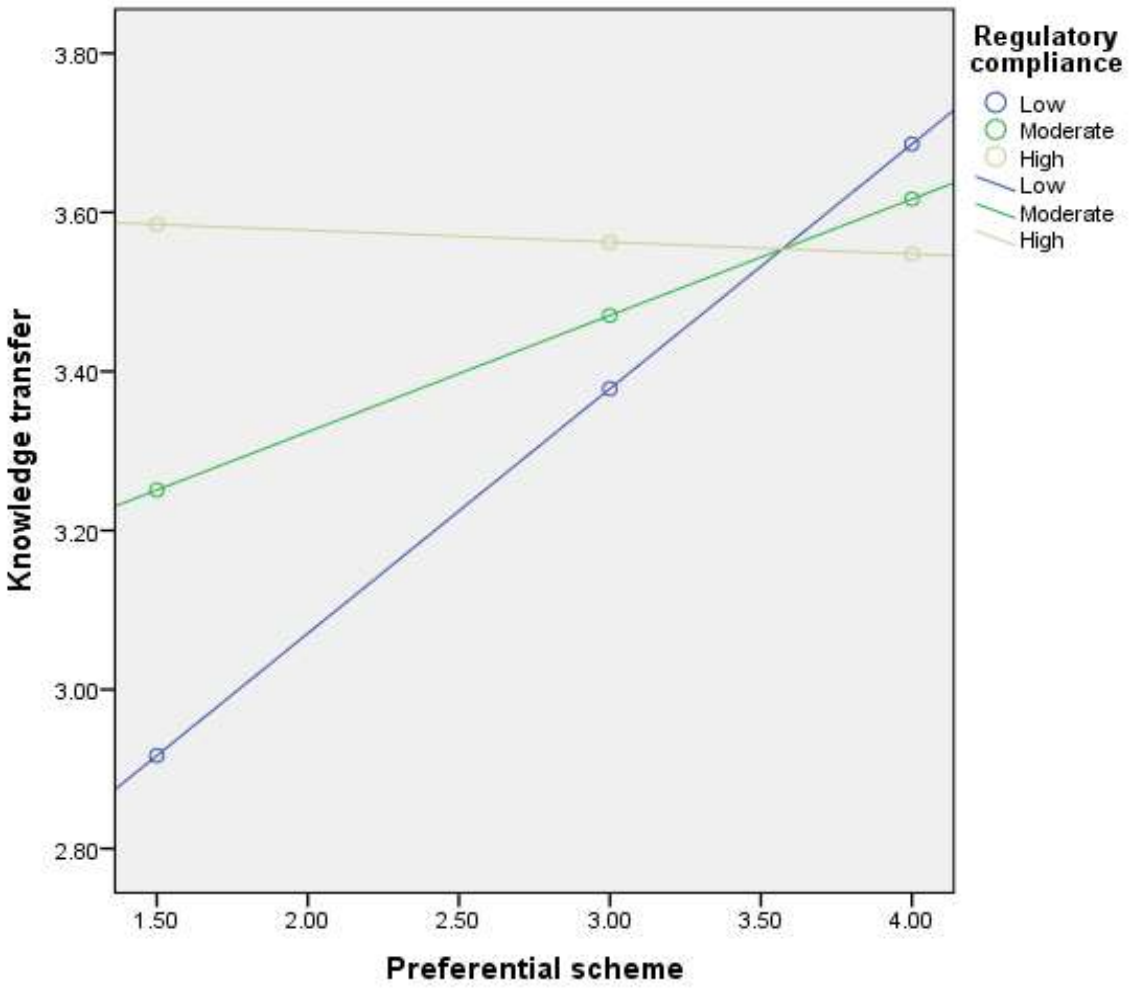


Figure 7-2: Interaction plot with moderator regulatory compliance

Source: Researcher (2020)

These results indicate that the relationship between the Preferential scheme and KT is different at low and high regulatory compliance. Specifically, for low regulatory compliance, the line is positive, indicating that participation in the Preferential scheme increases the level of KT for local contractors. In contrast, the line for high regulatory compliance is flat to negative, indicating low KT. Furthermore, the three lines, low, moderate, and high regulatory compliance, cross each other at some point, indicating a significant moderation. The relationship between the Preferential scheme and KT is positive for low regulatory compliance and negative for high regulatory compliance.

7.8.3 Moderation role of regulatory compliance on NCC training and KT

The moderation effect of regulatory compliance on the relationship between NCC training and KT is statistically significant, b= -.225, 95 per cent CI (-.337, -.224), t= -3.998, p<.001. The results indicate that the relationship between NCC training and KT is moderated by regulatory compliance.

Table 7-10: Moderation between NCC training X regulatory compliance

	b	**SE (B)**	**t**	**p**
Constant	.253 [-.743, 1.249]	.504	.502	P=.617
NCC training	.905 [.621, 1.190]	.144	6.283	P<.001
Regulatory compliance	.815 [.437, 1.193]	.192	4.256	P<.001
NCC training X regulatory compliance	-.225 [-.337, -.114]	.056	-3.998	P<.001
Company age	-.006 [-.030, .018]	.012	-.517	P=.606
Number of employees	.079 [-.072, .230]	.077	1.030	P=.304

Source: Researcher (2020)

7.8.4 Visualising interactions: NCC training X regulatory compliance

Figure 7-3 shows the interaction effect of the moderator variable plotted at 15th, 50th, and 84th percentiles.

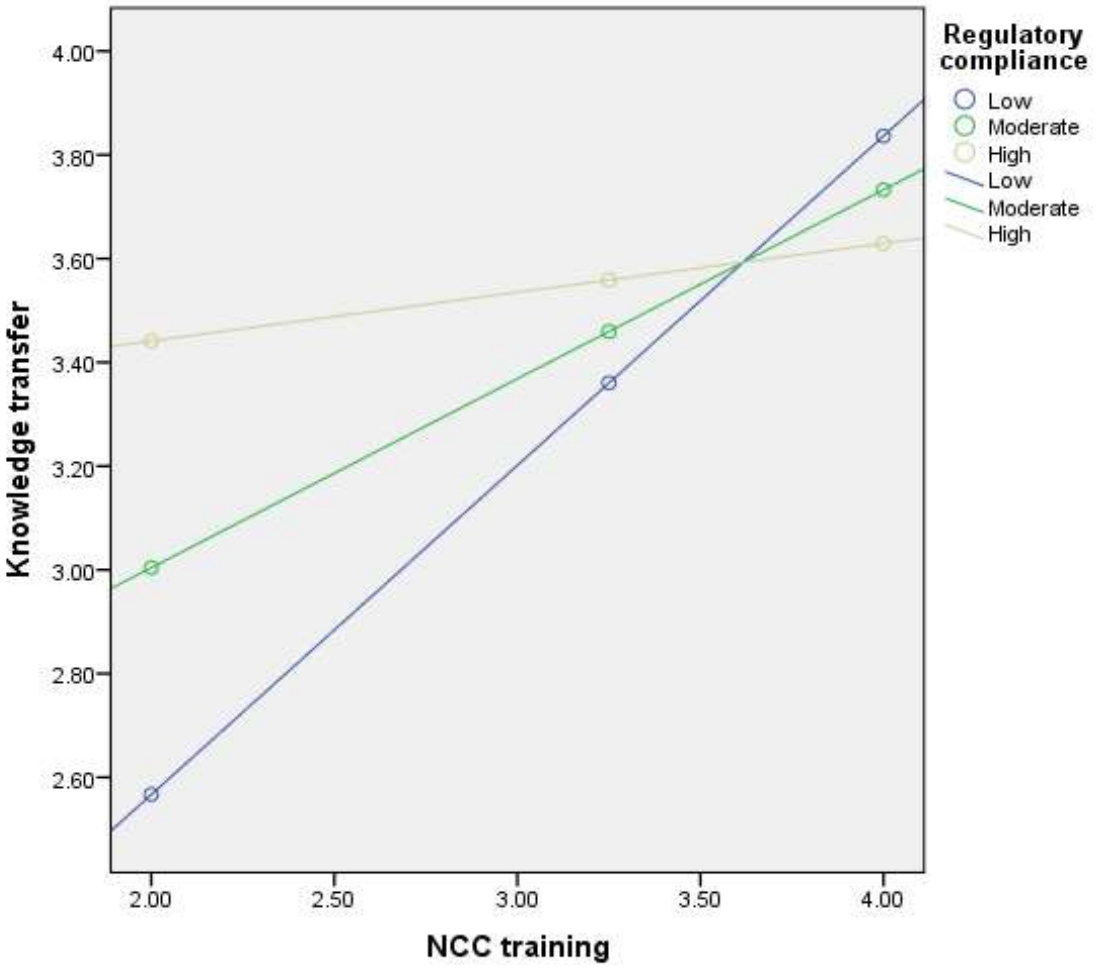


Figure 7-3: Interaction plot with moderator regulatory compliance

Source: Researcher (2020)

These results indicate that the relationship between NCC training and KT is different at low and high regulatory compliance. Specifically, for low regulatory compliance, the line is positive, indicating that participation in NCC training increases the level of KT for local contractors. In contrast, the line for high regulatory compliance is flat to negative, indicating low KT. Moreover, the three lines, low, moderate, and high regulatory compliance, cross each other at some point, indicate a significant moderation. In sum, the relationship between NCC training and KT is significant for low regulatory compliance compared to high regulatory compliance.

However, the hypothesised moderating role for the 20 per cent subcontracting policy, Reservation scheme, and Construction Finance Initiative were not significant. However, a significant interaction effect shows moderation; however, in the 20 per cent subcontracting policy, b=.166, 95 per cent CI (-.195, .527), t=.909, p=.365; Reservation scheme b= -.041, 95 per cent CI (-.417, .336), t= -.213, p=.832 and Construction Finance Initiative b=.118, 95 per cent CI (-.334, .570), t= .515, p= .608. The results indicate that the relationship between the 20 per cent subcontracting policy, Reservation scheme, and Construction Finance Initiative and KT was not moderated by regulatory compliance.

7.8.5 Moderation role of government support on NCC training and KT

The moderation effect of government support on the relationship between NCC training and KT is significant. Table 7-11 indicates that b= -.153, 95 per cent CI (-.294, -.013), t= -2.154, p<.05, indicating that the relationship between NCC training and KT is moderated by government support.

Table 7-11: Moderation between NCC training X Government support

	b	**SE (B)**	**t**	**p**
Constant	.761 [-.376, 1.899]	.576	1.321	P=.188
NCC training	.726 [.355, 1.100]	.188	3.868	P<.001
Government support	.626 [.178, 1.075]	.227	2.757	P<.01
NCC training X government support	-.153 [-.294, -.013]	.071	-2.154	P<.05
Company age	-.010 [-.034, .015]	.012	-.785	P=.434
Number of employees	.076 [-.080, .233]	.079	.965	P=.336

Source: Researcher (2020)

7.8.6 Visualising interactions: NCC training X government support

Figure 7-4 shows the interaction effect of the moderator variable plotted at 15th, 50th, and 84th percentiles.

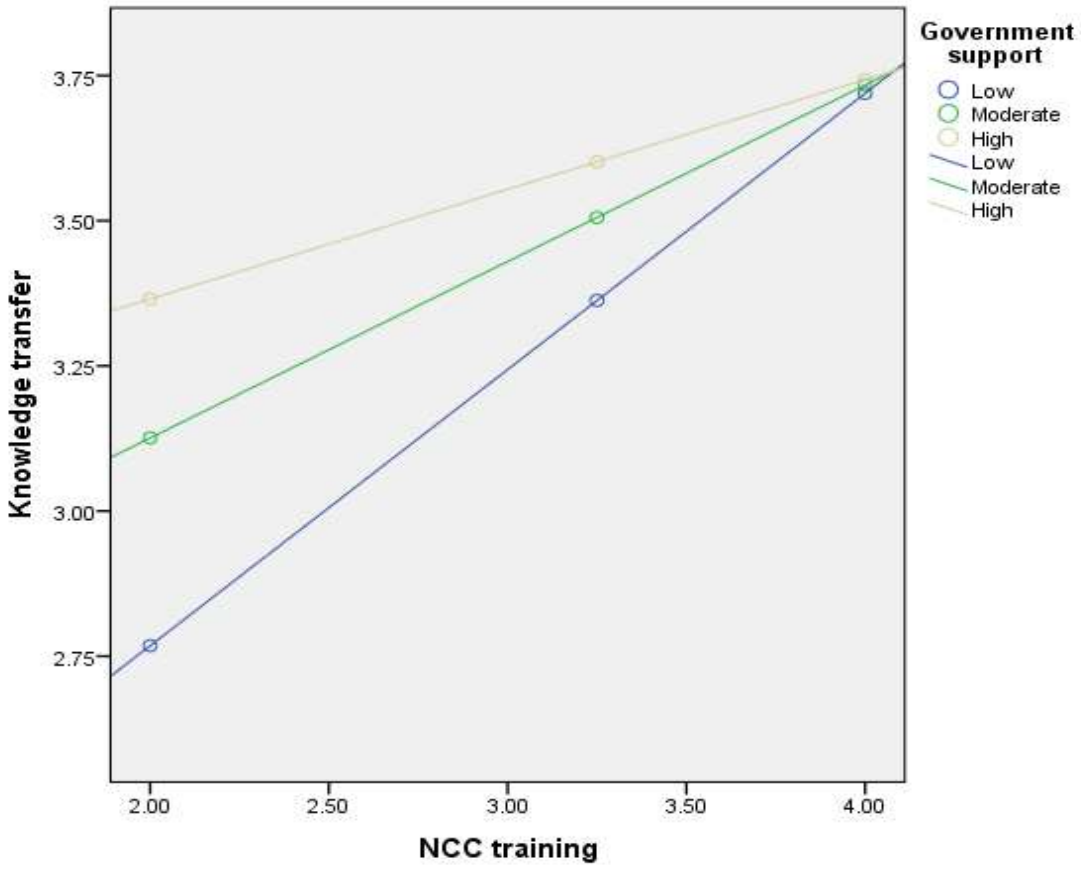


Figure 7-4 Interaction plot with moderator Government support

Source: Researcher (2020)

As can be seen from the graph, the effect of NCC training on KT appears to be consistently positive, regardless of government support. The results indicate that the relationship between NCC training and KT is similar at low, moderate, and high government support. Specifically, different levels of government support increase KT to local contractors participating in NCC training. Unlike regulatory compliance, the three lines, low, moderate, and high government support, link each other at the same point, indicating a significant constant moderation.

However, the hypothesised moderating role for the 20 per cent subcontracting policy, Reservation scheme, Preferential scheme, and Construction Finance Initiative was not significant. A significant interaction effect shows moderation; however, in the case of the 20 per cent subcontracting policy, b=.283, 95 per cent CI (-.127, .693), t=.208, p=.175; Reservation scheme b=.107, 95 per cent CI (-.359, .573), t= .454, p=.650; Preferential scheme b= .103, 95 per cent CI (-.351, .557), t= .450, p=.654 and Construction Finance Initiative b=.118, 95 per cent CI (-.334, .570), t=.515, p=.608. The results indicate that the relationship between the 20 per cent subcontracting policy, Reservation scheme, Preferential scheme, and Construction Finance Initiative and KT was not moderated by government support.

7.8.7 Double moderation role of regulatory compliance/government support on NCC training and KT

The double moderation effect of regulatory compliance and government support on the relationship between NCC training and KT is significant for regulatory compliance only b= -.216, 95 per cent CI (-.350, -.082), t= -3.184, p<.01 and insignificant for government support b=-.006, 95 per cent CI (-.171, .159), t= .510, p=.611. The results indicate that the relationship between NCC training and KT is moderated by regulatory compliance and not government support in the combined model.

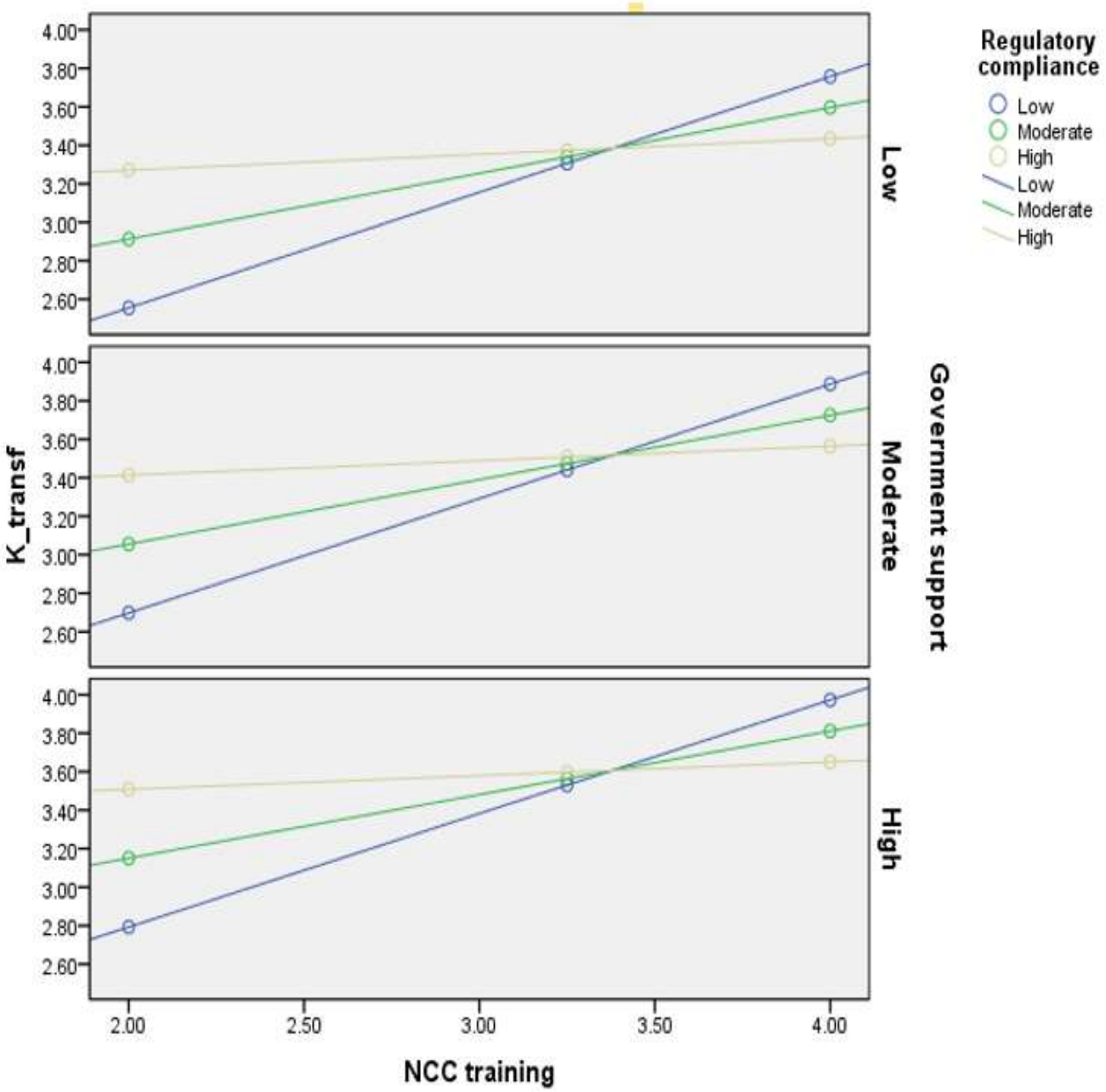
Table 7-12 NCC training X regulatory compliance and NCC training X government support

	b	**SE (B)**	**t**	**p**
Constant	.183 [-.986, 1.352]	.592	.309	P=.758
NCC training	.870 [.498, 1.243]	.189	4.614	P<.001
Regulatory compliance	.731 [.265, 1.197]	.236	3.096	P<.01
NCC training X regulatory compliance	-.216 [-.350, -.082]	.068	-3.184	P<.01
Government support	.139 [-.399, .677]	.273	.510	P=.611
NCC training X Government support	-.006 [-.171, .159]	.083	-.071	P=.944
Company age	-.005 [-.029, .020]	.012	-.381	P=.704
Number of employees	.070 [-.082, .223]	.077	.909	P=.365

Source: Researcher (2020)

7.8.8 Visualising interactions: NCC training X regulatory compliance and NCC training X government support

Figure 7-5 shows the interaction effect of the moderator variable plotted at 15th, 50th, and 84th percentiles.



Note: K_transf means knowledge transfer

Figure 7-5: Interaction plot with moderators Government support and regulatory compliance

Source: Researcher (2020)

The effect of NCC training on KT appears to be reasonably consistently positive at different levels of government support. However, interestingly, low government support indicates relatively low compliance as well. The results indicate that the relationship between NCC training and KT is different at low to high levels of regulatory compliance. Specifically, low regulatory compliance increases KT to local contractors compared to high regulatory compliance, as demonstrated in the graph above.

However, the hypothesised double moderating role of regulatory compliance and government support were not significant for the 20 per cent subcontracting policy, Reservation scheme, Preferential scheme, and Construction Finance Initiative. For example, the 20 per cent subcontracting policy and regulatory compliance b=.082, 95 per cent CI (-.088, .252), t= .951, p=.343 and the 20 per cent subcontracting policy and government support b= -.127, 95 per cent CI (-.320, .066), t= -1.298, p=.196. Furthermore, Reservation scheme and regulatory compliance b= .108, 95 per cent CI (-.077, .293), t= 1.151, p= .251 and between Reservation scheme and government support b= -.143, 95 per cent CI (-.372, .086), t= -1.236, p=.218.

Similarly, the interaction between Preferential scheme and regulatory compliance b= -.164, 95 per cent CI (-.372, .000), t= -1.972, p=.050 and between Preferential and government support b= .169, 95 per cent CI (-.027, .365), t= 1.700, p=.091. The interaction effect of Construction Finance Initiative and regulatory compliance b=.003, 95 per cent CI (-.146, .153), t=.046, p=.964 and between Construction Finance Initiative and government support b= -.048, 95 per cent CI (-.206, .110), t= -.599, p=.550. All these interactions indicate that their relationship with KT were not moderated by regulatory compliance and government support.

In sum, the results address objective 4, which is *to investigate the moderating role of institutional factors on the relationship between ISD initiatives and KT*. The results show that regulatory compliance moderates the relationship between two ISD initiatives (Preferential scheme and NCC training) and KT. Furthermore, government support moderates the relationship between NCC training and KT. However, there is no evidence of any significant moderation effect of both regulatory compliance and government support on the relationship between three ISD initiatives (the 20 per cent subcontracting, Reservation scheme, and Construction Finance Initiative) and KT in the current study.

7.9 Chapter summary

The current chapter has addressed the four research objectives of the research study: establishing which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT, examining the effect of KT on

operational performance, investigating the mediating role of AC on the relationship between KT and operational performance and the moderating role of institutional factors on the relationship between ISD initiatives and KT. The chapter used multiple hierarchical regression analysis and PROCESS Macro to address the research objectives. Results show that NCC training and the 20 per cent subcontracting policy are significantly and positively associated with KT. Second, the results have ascertained that KT has a positive and significant effect on local contractors' operational performance and AC.

Furthermore, the results show that knowledge acquisition, assimilation, and application do not individually mediate the relationship between KT and the operational performance of local contractors. However, knowledge transformation and overall AC mediate the relationship between KT and the operational performance of local contractors. Besides, moderation results show that the relationship between the Preferential scheme and KT and NCC training and KT is moderated by regulatory compliance. Furthermore, the relationship between NCC training and KT is moderated by government support. The double moderation of regulatory compliance and government support on the relationship between NCC training and KT is significant for regulatory compliance and insignificant for government support.

Eleven hypotheses (H_1, H_2, H_3, H_4, H_5, H_6, H_7, H_8, $H_{9a,}$ $H_{9b,}$ and H_{10}) tested the relationships between the variables in the conceptual framework. The results indicate that eight hypotheses, except for H_2, $H_{3,}$ and $H_{5,}$ were statistically significant and, thus, accepted. The AC multidimensional constructs showed varied results; however, overall, the hypothesis on AC mediation was statistically significant.

The next chapter discusses the findings for both the qualitative (chapter 6) and quantitative studies (chapter 7). The results will be discussed in the context of the literature in chapters 2 and 3.

CHAPTER 8

DISCUSSION OF FINDINGS

8.1 Introduction

The preceding chapters have presented the qualitative (chapter 6) and quantitative studies (chapter 7). The current chapter discusses the findings from both qualitative and quantitative studies. Furthermore, the research findings are discussed in the context of the literature review in chapter 2 and chapter 3. The discussion also reflects on the knowledge-based view, AC, and institutional theories in chapter 4. Additionally, the chapter addresses the possible justifications for the significance and insignificance of relationships in the conceptual framework in chapter 4.

The current chapter is organised as follows. Section 8.2 presents an overview and a summary of the research findings, followed by a discussion of research findings from both the qualitative and quantitative studies in section 8.3. The findings are discussed according to the objectives of the study. Section 8.4 presents a summary of the chapter.

8.2 Overview and summary of the findings

The objective of public procurement is to deliver value to its citizens, and procuring entities are held accountable for responsible spending of the public purse. The use of procurement as a public policy tool to stimulate socio-economic development, mainly through ISD initiatives, is a common policy theme across the globe (Loader and Norton, 2015; Patil, 2017; Grandia and Meehan, 2017; Hawkins, Gravier and Randall, 2018). Public procurement constitutes a significant market used mainly by SMEs and governments to drive various policies (Loader, 2017; Basheka, 2018). SME access to public procurement can be pursued directly through ISD initiatives such as reservation schemes (set-asides), preferential schemes, subcontracting, training, and easy access to finance, particularly in the construction industry.

However, to stimulate socio-economic development through public procurement policy, there is a need to ensure linkages between major players in an economy. Relationships between major players in the private sector, government, and SMEs are critical to achieving socio-economic development. The linkages are mainly affected by the market regulatory climate and government policies that promote or impede business growth (Arráiz, Henríquez and Stucchi, 2013). However, the AC of SMEs to exploit government value-creation policies to compete favourably with foreign actors is a key factor influencing such ties, as the studies show (Flatten, Greve and Brettel, 2011; Arráiz, Henríquez and Stucchi, 2013).

Supplier development is one approach to ensuring the continuous development of local SME capabilities. It is an intentional effort by the buying organisation to improve the performance of its suppliers (Handfield *et al.,* 2000; McKevitt and Davis, 2014; Glock, 2017). Examples of supplier development practices include training, technical assistance, on-site problem solving, and the sharing of equipment and information in order to improve supplier performance (Sucky and Durst, 2013; Sancha, Longoni and Giménez, 2015; Sillanpää, Shahzad and Sillanpää, 2015; Chen, Ellis and Holsapple, 2018).

Furthermore, Chen, Ellis and Holsapple (2018) contextualise supplier development, from a knowledge management perspective, as a set of knowledge management activities such as knowledge acquisition, selection, generation and assimilation that are carried out by both the buyer and supplier. Knowledge management activities are designed to meet the supply needs of the buying organisation by facilitating continuous performance and capability improvement (Wagner, 2010). Furthermore, Zia (2020) argues that SME knowledge management in a project-based organisation tends to be overly informal without a well-developed information management system. However, supplier development from the knowledge management perspective has hitherto received relatively less attention, and the current research study partly contributes to this perspective using ISD initiatives in the construction industry.

Research is abounding that supplier development as a company strategy has achieved some success in the private sector through KT (Marksberry, 2012; Chen, Ellis and Holsapple, 2015). The crucial role of supplier development in the private sector can also be applied to the public procurement market, which accounts for a significant contribution to the GDP (OECD, 2017; OECD, 2019; Hawkins, Gravier and Randall, 2018; Asamoah, Annan and Rockson, 2019). Although scholars acknowledge that public procurement is a vital sector for stimulating socio-economic activities, Grandia and Meehan (2017) argue that it remains underexplored as a policy tool for stimulating socio-economic development.

This research study has focused on ISD initiatives implemented through SME oriented public procurement regulations and policies in line with the preceding points. The primary purpose of such public interventions is to ensure a diverse and competitive supply marketplace and support SME inclusion in public procurement, which contributes to domestic productivity (Arráiz, Henríquez and Stucchi, 2013; *al.,* 2013; Cravero, 2018; Flynn, 2018). The study focused on ISD initiatives delivered by the main contractors through subcontracting of various works to local contractors (Kidalov, 2013; Cheelo and Liebenthal, 2018; Cheelo and Liebenthal, 2020). Other initiatives considered include the participation of local contractors in Preferential or Reservation schemes (Marion, 2007), training

(Modi and Mabert, 2007), and provision of construction finance as part of capacity building (GRZ, 2014). Despite the critical role they play in public procurement, the effect of ISD initiatives on KT remains under research, particularly in the construction industry such as Zambia's (GRZ, 2014; Cheelo and Liebenthal, 2018). This research study is one of the early empirical research to examine the efficacy of ISD initiatives on KT and operational performance in the construction industry.

The current study sought to identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. Furthermore, the research established which ISD initiatives are associated with KT. Moreover, the research study examined the effect of KT on the operational performance of local contractors. Furthermore, the study investigated the mediating role of AC on the relationship between KT and operational performance and the moderating effect of institutional factors on the relationship between ISD initiatives and KT in the construction industry in Zambia. The research study utilised both qualitative and quantitative studies to address the research questions. Table 8-1 presents a summary of the findings.

Table 8-1: Summary of findings

Research question (RQ)	Summary of findings	
RQ.1 What are the main institutional factors influencing the implementation of ISD initiatives	***Summary of qualitative findings*** -The implementation of the ISD initiatives are subjected to strong political influence. -Corruption is a common feature of the construction industry and has contributed to unfair competition between local and foreign contractors -Inadequate monitoring and evaluation systems. Partly because of the lack of a robust regulatory system to implement and monitor the progress of the initiatives. -Fronting is also a significant challenge for the effective implementation of ISD initiatives. -However, information dissemination has been effective, and that local contractors are aware of these initiatives. -NCC training is not linked to winning future contracts and hence, not responsive to contractor needs. -Construction Finance Initiative has failed to materialise due to lack of critical stakeholders' buy-in and the absence of the legal framework	
RQ.2 Which ISD initiatives are associated with KT?	***Summary of quantitative findings*** **H_1:** ISD (20 per cent mandatory subcontracting policy) is positively associated with KT (**Supported).** **H_2:** ISD (Preferential scheme) is positively associated with KT (**Not supported).** **H_3:** ISD (Reservation scheme) is positively associated with KT (**Not supported).** **H_4:** ISD (NCC training programme) is positively associated with KT (**Supported).** **H_5:** ISD (Construction Finance Initiative) is positively associated with KT (**Not supported).**	***Summary of qualitative findings*** -Three experts (3 out of 9) agreed that some initiatives are working in terms of KT to local contractors. -Experts particularly cited the 20 per cent subcontracting as one initiative that has been vital in KT in the road construction sector, where subcontractors can execute a significant scope of work. -Experts also acknowledged the role of training. However, they argued that in its current form, it was not responsive to contractor needs.
RQ.3 To what extent does KT affect operational performance?	***Summary of quantitative findings*** **H_6:** KT has a positive influence on the AC of local contractors (**Supported).** **H_7:** KT has a positive influence on the operational performance of local contractors **(Supported).**	***Summary of qualitative findings*** -Interestingly, there is consensus among experts that the 20 per cent subcontracting policy has contributed to the empowerment objectives, and approximately 1359 local contractors have been attached to major contractors. -The findings show that more local contractors access significant scope of work in the road construction sector. -However, there is a need for a regulatory framework to enhance further the effectiveness of the 20 per cent subcontracting policy
RQ.4 Does AC mediate the relationship between KT and operational performance?	***Summary of quantitative findings*** **H_8**: AC has a positive influence on the operational performance of local contractors. **(Supported).** **H_{10}**: AC mediates the relationship between KT and operational performance. **(Supported).**	
RQ.5 Do institutional factors moderate the relationship between ISD and KT?	***Summary of quantitative findings*** **H_{9a}**: Regulatory compliance moderates the relationship between ISD and KT (**Supported for the Preferential scheme and NCC training).** **H_{9b}**: Government support moderates the relationship between ISD and KT (**Supported for NCC training only).**	

Source: Researcher (2020)

8.3 Discussion

8.3.1 Objective 1: Main institutional factors influencing ISD initiatives

This research study sought to identify the main institutional factors influencing the implementation of ISDs in the construction industry in Zambia using expert interviews. The main institutional factors influencing the implementation of ISD initiatives are political influence, corruption and unfair competition, criteria for participating in ISD initiatives and information dissemination. Other factors include monitoring and evaluation systems, robustness of the regulatory system, general administrative and business institutional challenges, fronting, an unresponsive NCC training model and the construction financing model.

The findings demonstrate that ISD initiatives are affected by strong political influence by government politicians, who sometimes exercise extreme power and control over technocrats. While corruption is a common feature of the construction industry, the findings indicate that it has also contributed to the unfair competition where local contractors are forced to compete with foreign contractors. Experts revealed that foreign contractors have access to cheap financing, and some are state-owned enterprises with access to cheap finance from their respective governments.

These findings are consistent with existing literature in the public procurement of infrastructure projects. For example, Kalyongwe *et al.* (2018) examined the contextual factors that support corruption in the procurement of construction projects in Zambia. The study identified several such contextual factors such as culture, the complexity of construction projects, weak regulatory systems, while political interference was a major contextual factor that aids corruption. Other scholars echo these findings and argue that political influence adversely affects SME oriented public procurement policies, particularly in the construction industry. For example, Patil (2017) argues that implementing SME oriented public procurement policies depends on the interplay of some political factors and their critical role in supporting the policies. However, political interference by political representatives delegitimises public institutions in the implementation of government initiatives. Furthermore, Shan *et al.* (2015) reiterate that public construction projects, in particular, face a high risk of corruption, as the public construction sector is the most corrupt.

The study further reveals that the current criteria for engaging local contractors are not clear, as evidenced by mixed perceptions from experts. The criteria for participation in the ISD initiatives have a profound effect on who benefits from the initiatives. In conventional private sector literature, a supplier must meet specific requirements to participate in supplier development initiatives (Modi and Mabert, 2007). For example, Gosling *et al.* (2015) argue that not all suppliers are eligible to participate in supplier development. Hence the need to screen and rank them. Ranking suppliers based

on key attributes such as financial capacity, quality, learning ability and willingness to collaborate is essential as a precursor to rigorous supplier development efforts (Modi and Mabert, 2007).

Furthermore, inadequate monitoring and evaluation systems are critical institutional factors identified in the implementation of ISD initiatives. Additionally, inadequate monitoring is partly due to a weak regulatory system for implementing and monitoring the progress of ISD initiatives. Implementation of any policy initiative requires systematic monitoring and evaluation systems to ensure that the appropriate tracking of progress and information is readily available to stakeholders (Davis and Brady, 2015). However, Kidalov (2013) notes that merely monitoring the main contractors' subcontracting efforts has failed to bring the local contractors into line with the government interest. Therefore, strict measures are needed to ensure more binding, or aligning, of the interests of main contractors, governments, contracting entities, and other public policymakers (Davis and Brady, 2015).

Generally, the research study reveals that the regulatory system is not robust enough. For example, the 20 per cent subcontracting policy lacks a legal framework to facilitate its implementation. The regulatory system forms part of the institutional regulatory factors that help organisations adopt best practices (Zhu and Sarkis, 2007). Government, through regulation and regulatory enforcement, helps stakeholders in the construction industry to implement ISD initiatives. However, the effectiveness of ISD initiatives depends on the robustness of the regulatory system (Patil, 2017). For example, in the review of USA and EU SME subcontracting policy and practices, Kidalov (2013) emphasises the preference for binding mandatory subcontracting obligations on the part of the main contractor. To this end, the EU argues that subcontracting deserves legal certainty concerning participation in large government-funded projects. On the other hand, the USA's Small Business Jobs Act of 2010 has imposed mandatory subcontracting obligations as a national policy. Mandatory subcontracting can minimise unethical practices, such as 'bait-and-switch' fraud, by certifying that main contractors will use subcontractors designated in their proposal.

There are many institutional factors affecting the implementation of Preferential and Reservation schemes in the construction industry in Zambia. These include fronting, corruption, and unfair competition. Fronting is exacerbated by weak regulatory frameworks regulating ISD initiatives and inadequate institutional capacity, especially on public procurement officers. Additionally, the study argues that NCC training and the Construction Finance Initiative have not responded adequately to the needs of local contractors. For example, it is evident from the findings that the current NCC training is not linked to winning future contracts and is relatively expensive for the average contractor. The Construction Finance Initiative has not materialised due to the failure of

critical stakeholders to develop a customised financing model that is responsive to the needs of local contractors.

General institutional challenges are factors inherent in the operating business environment, whether human or business, that adversely affect the implementation of ISD initiatives. The research study reveals that limited finances to mobilise, access to finance, equipment, and poor skills are very prominent in the sector. Literature is abounding that the lack of adequate skills has also contributed to poor quality works by local contractors who have benefited from SME oriented public procurement policies (Hawkins *et al.*, 2018). In order to hedge against the risk of poor performance, Nakabayashi (2013) proposes that contractors must take preliminary qualification examinations to ascertain their capability before bidding for a contract.

However, the research findings disclosed that information dissemination has been effective and that local contractors are aware of ISD initiatives. It is the government's role to promote information dissemination and exchanges about local suppliers to enhance their participation in government initiatives (Marion, 2007). Information dissemination reduces the search cost for large organisations that may not know potential local suppliers or find it too costly to find them (Arráiz, Henríquez and Stucchi, 2013). Kidalov (2013) argues that accurate information must be made available on subcontracting, and the legal status of subcontractors must be clearly defined to enhance contractor participation.

Interestingly, there was also consensus among experts that ISD initiatives have contributed to empowerment objectives, particularly the 20 per cent subcontracting policy. Moreover, approximately 1,359 local contractors work with main contractors. The findings reveal that more local contractors have access to a significant scope of work than auxiliary works, as was the case in the recent past.

The above findings also reflect the nature of public procurement and SME-oriented policies in the sector. Generally, the problems experienced by SMEs in public procurement are a function of the bureaucratic nature of public procurement guided by a rigid regulatory framework. Furthermore, the participation of SMEs in public procurement remains a challenge that requires continuous interrogation to ensure that the public tendering systems consider the limitation of SMEs.

8.3.2 Objective 2: ISD initiatives associated with KT

The study contributes to the knowledge-based view by demonstrating the association of ISD initiatives with KT in the construction industry in Zambia. The findings in the study clarify that while the government has implemented several ISD initiatives in the construction industry in Zambia, they

have different implications on KT. The research reveals that only the 20 per cent subcontracting policy and NCC training are significantly associated with KT. The results show a positive and significant association between the 20 per cent subcontracting policy and KT. Furthermore, NCC training was also positively and significantly associated with KT. However, the Preferential scheme, Reservation scheme, and Construction Finance Initiative are not significantly associated with KT.

The findings demonstrate that the 20 per cent subcontracting policy and NCC training involve interactions between the knowledge donators and receivers. In this context, subcontracting involves interaction between the main contractor and the subcontractor in executing works. Similarly, training generally involves interaction between the trainer and the trainee. These activities fall under what is called direct supplier development. Direct supplier development instigates trusting relationships, fosters communication of strategies, and is a vehicle for stimulating KT. However, the Preferential scheme, Reservation scheme, and Construction Finance Initiative do not involve direct interaction and therefore fall under indirect supplier development. Indirect supplier development involves very little investment in knowledge management activities in supplier development.

The findings are consistent with existing literature, which argues that direct supplier development activities involving high interactions are associated with KT (Modi and Mabert, 2007; Wagner, 2010; Arroyo-López, Holmen and de Boer, 2012; Grandinetti, 2016; Smyth and Duryan, 2020). For example, Wagner (2010) distinguishes between indirect and direct supplier development and argues that direct supplier development, such as training, on-site problem solving, and investment in supplier employees, is significantly associated with KT. Similarly, Arroyo-López, Holmen and de Boer (2012) argue that although supplier development involves collaboration, only investment in supplier employees and training is associated with KT. In their study of knowledge management in supplier development, Chen, Ellis and Holsapple (2018) argue that supplier development increases the stock of new knowledge in the suppliers' repository, which ultimately improves its capability and performance.

In summary, the above studies recognise the importance of knowledge as a strategic resource and highlight the role of supplier development in facilitating KT. Furthermore, Grandinetti (2016) argues that the interaction between large organisations and SMEs create a context where SMEs access knowledge produced by a large organisation. The following sections discuss the results of each ISD initiative in relation to KT.

8.3.2.1 NCC training

Training is one of the most famous examples of ISD initiative that facilitates KT, where a buying organisation acts as a 'teacher' to the supplier, or 'student,' who is the recipient of knowledge

for performance improvement (Kim *et al.*, 2015). In this context, the buying organisation initiates KT to the supplier in order to improve its performance. Organisations have widely used training as vehicles for KT, from buying organisations, which are relatively large with well-developed knowledge management systems, to the small organisation seeking knowledge for performance improvement. For example, leading companies such as Toyota and Hyundai have extensively used training as part of supplier development (Kim, 1998; Marksberry, 2012; Chen, Ellis and Holsapple, 2018).

In order to develop supplier capabilities through the adoption of the Toyota Production System, Toyota engaged in supplier training and seconded engineers to supplier organisations as part of supplier development (Wagner and Krause, 2009; Marksberry, 2012). Additionally, in their study of the mediation effect of AC on the relationship between organisational slack and innovation performance, Duan, Wang and Zhou (2020) argue that technical training enhances the AC because it improves the interaction between individuals or groups. Additionally, such interactions expand the existing knowledge and possibly turning it into new innovative products. Ling *et al.* (2020) reiterate that informal and formal training enhances the individual and organisational AC and improves knowledge sharing.

There is also evidence of KT through various training activities in public sector procurement. For example, Arroyo-López, Holmen and de Boer (2012) found that ISD initiatives in Mexico facilitate KT and, subsequently, improve participants' capabilities and competitiveness. Similarly, Arráiz, Henríquez and Stucchi (2013) report comparable findings in the Chilean supplier development programme, which resulted in increased sales, employment, and the sustainability of SME suppliers and large organisations. Furthermore, in their evaluation of contractor development programme in South Africa, which involved training contractors, Dapaah, Thwala and Musonda (2016) found that the programme led to contractor upgrades in registration status and increased participation in the construction industry. The findings contribute to the existing literature by reaffirming that training is associated with KT in the construction industry.

However, experts interviewed indicated that the current NCC training model in the Zambian construction industry is not responsive to industry needs. The cost of accessing training is prohibitive for most local contractors. Additionally, there was a general feeling among experts that there was no connection between NCC training and winning future contracts. Experts argued that contractors who have been trained and returned to the NCC register consistently had not won a single contract for years, and the NCC does not follow up to know how they are applying the skills they learned, as indicated in the quote below:

"……you find that the contractor who registers with NCC today is the one who gets a contract. The contractor who has been there for five or even ten years has nothing, no contract whatsoever. So, it is chaotic, the arrangement has been chaotic, we have good initiatives if only we have a proper system, we would implement, but without a proper system, I doubt if we will see the results. I think that is where we need to work on, linking the training to contracts being awarded" (EP3).

8.3.2.2 The 20 per cent subcontracting policy

Subcontracting is another common supplier development practice in the construction industry. The main contractors use subcontractors to achieve specific objectives, including cost reduction, access to specialised services, and risk-sharing (Choudhry *et al.*, 2012). In addition to the monetary gain, the subcontractor benefits from KT during the interaction with the main contractor. The collaboration between the main contractor and subcontractor has been enlisted in ISD initiatives as a critical strategy for developing contractor capacity (Maréchal and Morand, 2012). Subcontracting is a typical ISD initiative used in the public procurement of construction projects to develop contractor capacity.

The study finding reveals that the 20 per cent subcontracting policy is associated with KT, which is also consistent with previous studies. For example, Maréchal and Morand (2012) argue that, under the subcontracting policy, the government awards a contract to the main contractor, requiring the main contractor to subcontract a certain percentage of the value of the contract to local contractors as a means of transferring knowledge to the subcontractor. The 20 per cent subcontracting policy is another example of direct supplier development where the main contractor, who wins a public contract, subcontracts labour, material, and services to the subcontractor (Hartmann and Caerteling, 2010). During the project execution, the main contractor and subcontractor engage in various KT activities, such as on-site problem solving whenever they arise. The main contractor may offer technical assistance to the subcontractor and performance evaluation for future improvements. These activities comprise direct supplier development (Krause, 2014) and are strongly associated with KT (Wagner, 2010).

Experts also acknowledged the relationship between the 20 per cent subcontracting policy and KT in the construction industry. Findings from the qualitative study show that most of the experts recognised that the 20 per cent subcontracting policy initiative has contributed to KT benefitting local contractors, particularly in the road sector. Experts revealed that some contractors had acquired construction skills through the 20 per cent subcontracting policy.

The following excerpts highlight the expert opinion on the association between 20 per cent subcontracting and KT

> *"……. right now, most of the road infrastructure being done around Lusaka and the Copperbelt involves Zambian subcontractors. Most of the works they are doing, the paving, the drainages, and things like that, I see what they are doing, and they are doing good quality works which they have learned from the same subcontracting initiative. So, there has been a transfer of knowledge there. I have spoken to some of them, and I interact with them quite often, and I think there has been a good level of knowledge transfer"* (EP2).

In contrast to the findings in the current research, KT is still a challenge in the construction industry because of various factors. For example, in their study of KT in the construction supply chain, Smyth and Duryan (2020) argue that KT in the construction industry has been generally weak because of several challenges. Firstly, the construction industry actors operate in silos characterised by adversarial relationships because of too much emphasis on price competition (Hartmann and Caerteling, 2010; Smyth and Duryan, 2020). Secondly, the construction industry is characterised by transient organisations with weak knowledge and AC because of KT discontinuities within and among organisations (Lawrence, Chan and James, 2016; Ali, Musawir and Ali, 2018). Moreover, Saini, Arif and Kulonda (2019) add that the fragmentation of the construction supply chain, and overreliance on traditional structures, also contribute to the challenges of KT in the construction industry.

Furthermore, Smyth and Duryan (2020) argue that KT requires collaboration and deeper cooperation among actors. Close interaction between the main contractor and subcontractor increases trust and open communication, which results in joint problem-solving. Existing literature argues that close collaboration reduces cognitive distance, enhances trust between parties in the relationship, and increases knowledge sharing (Giannakis, 2008; Squire, Cousins and Brown, 2009). Additionally, in their study of subcontracting, with a focus on the effect of trust and price in the construction industry, Hartmann and Caerteling (2010) call for a more integrated supply chain that includes improved relations, not only between clients (project sponsors) and main contractors but also enhanced collaboration between subcontractors and suppliers.

Close collaboration through increased emphasis on the dual role of public procurement, in terms of acquisition of goods and services and the promotion of disadvantaged SME businesses, can produce profound results (Oluka *et al.*, 2020). The promotion of disadvantaged businesses (mainly subcontractors in this context) in the construction industry requires specific, deliberate legislation to facilitate the interaction between the main contractor and subcontractor.

For example, in the Zambian context, findings from the qualitative study show that the main limitation of the current 20 per cent subcontracting policy is the lack of a legal framework. The absence of the legal framework has made it challenging to implement the 20 per cent subcontracting because it relies on the willingness of the main contractor to engage subcontractors. Phiri (2016) echoes similar findings in a research study on the efficacy of the 20 per cent subcontracting policy in the construction industry in Zambia.

In contrast, Kidalov (2013) argues that governments in both the USA and EU have enacted legislation to address the risks of voluntary subcontracting. The European Code of Best Practices (EU, 2008) and the USA Small Business Act, 2010 address the specific legislation that governs subcontracting initiatives in the EU and USA (Kidalov, 2013). In addition to legislation, Choudhry *et al.* (2012) propose prequalification, registration, and performance evaluation systems for subcontractors to address risks on the contractor side.

However, these legal interventions are currently lacking in implementing the 20 per cent subcontracting policy in Zambia. It was, therefore, imperative to address this gap by examining how the 20 per cent subcontracting policy is associated with KT to create an empirical basis for future policy intervention. In sum, the research study argues that although the findings indicate that the 20 per cent subcontracting policy is positively and significantly associated with KT, its implementation can be improved by enacting a legal framework.

8.3.2.3 Construction Finance Initiative

The findings revealed that the Construction Finance Initiative is not significantly associated with KT in the current study. A few arguments can help to explain the results. Firstly, Construction Finance Initiative is a third-party arrangement where the government, through relevant agencies, signs a memorandum of understanding with commercial banks and insurance companies to provide credit to local contractors who have no collateral (GRZ, 2014). This arrangement falls under indirect supplier development (Wagner, 2010; Krause, 2014) because there is no interaction between the main contractor or procuring agencies and the local contractors. Theoretically, this approach is not associated with KT in literature. KT requires close formal and informal interaction between the parties involved (Modi and Mabert, 2007; Squire, Cousins and Brown, 2009; Smyth and Duryan, 2020). Therefore, the research study has ascertained that the Construction Finance Initiative is not associated with KT.

Secondly, qualitative findings also confirm that the implementation of the Construction Finance Initiative has not been successful, because banks have failed to develop a customised financing model that is consistent with the needs of local contractors. Expert perceptions of the

financing model for contractors indicate that it has not worked, and therefore contractors have reverted to the traditional financing model. Experts revealed that the banks were not willing to support this initiative. As a result, the initiative has not produced any results because the banks were not flexible.

Furthermore, the financing model was not supported by any legal framework as it fell outside the mandate of both the RDA and the NRFA. The lack of a legal framework also adversely affected the implementation of the Construction Finance Initiative, as indicated in the following excerpt:

> *"RDA and NRFA, on their part, did not have the legal instruments to support this initiative, where they could guarantee that the contractor would pay back the funds advanced to him. You will find that the initiative has not produced the desired results and, as such, the contractors are still following the traditional banking arrangement" (EP3).*

8.3.2.4 Preferential and Reservation schemes

The results also show that the Preferential and Reservation schemes are not significantly associated with KT. Firstly, akin to the Construction Finance Initiative, Preferential and Reservation schemes do not involve direct interaction between the buyer and supplier, hence constitute indirect supplier development (Wagner, 2010). For example, individual contractors who meet the prescribed criteria are granted tender evaluation points to implement Preferential procurement (Ssennoga, 2006). Krasnokutskaya and Seim (2011) add that one of the most commonly used preference mechanisms is the bid discount at the financial evaluation stage. The mechanism is used to improve the bids of the preferred organisations by a pre-established rate when determining the winner but using the actual amount of the winner's bid in the contract. When implementing the Reservation scheme, specific contracts are reserved for targeted citizen influenced, empowered, or owned enterprises, while excluding non-targeted companies.

ISD initiatives such as Preferential and Reservation schemes enhance the participation of the prescribed organisation in the economic activities of a particular country. Therefore, Preferential and Reservation schemes are critical tools for contractor economic empowerment rather than KT. Theoretically, KT requires interaction between two or more organisations, in which a large organisation, with more advanced knowledge management systems, acts as a knowledge donor to the relatively small organisation, the knowledge receiver (Wagner, 2010; Chen, Ellis and Holsapple, 2018).

Furthermore, Preferential and Reservation schemes are affected by similar institutional factors because the same legislation governs them. Findings from the qualitative study revealed that

the initiatives suffer from a myriad of institutional challenges, such as fronting, corruption, inadequate institutional monitoring, and oversight. For example, one of the cited critical challenges in the Zambian construction industry is fronting. Fronting is a scenario where a foreign company fronts local citizens in the registration of the company to gain undue benefit from citizen targeted empowerment (Warikandwa and Osode, 2017). Experts asserted that fronting is a serious challenge in the implementation of Preferential and Reservation schemes in the construction industry, as highlighted in the following excerpt from one expert:

> *Fronting is one of the critical institutional challenges facing the construction industry in terms of implementing various government initiatives because it is difficult to prove. Most foreigners know the system and can circumvent it with the help of Zambians. As the regulatory body in the industry, we are trying our best to ensure that fronting is detected and dealt with at the earliest stage possible in the award of the contract. However, if contractors comply with the requirements of the law, even if we suspect that they may be fronts, it is difficult to deal with it, and this has been made even more difficult by Zambians who do not help"* (EP9).

Furthermore, the fact that the CEEC Act No. 9 of 2006 was enacted to guide the implementation of Preferential and Reservation schemes does not mean they are being complied with by procuring entities. Ibrahim *et al.* (2017) note that many African countries have enacted suitable procurement legislations, which are not effectively implemented because of different challenges. One challenge is the capacity on the procurement side to implement such initiatives for effective KT (Loader, 2017; Hawkins, Gravier and Randall, 2018). For example, Ibrahim *et al.* (2017) argue that while it is critical to comply with procurement laws, it is equally essential to ensure that compliance translates into achieving procurement objectives.

8.3.3 Objective 3: Effect of KT on operational performance

Effectiveness of KT is the ability of the supplier, who is the recipient of buyer-driven KT, to apply knowledge for operational performance improvements (Kim *et al.*, 2015). The findings reveal that KT has a positive effect on the operational performance of local contractors. The results indicate that KT from the 20 per cent subcontracting policy and NCC training is assimilated, transformed, and applied for performance improvement. Knowledge application is manifested through delivering projects to quality standards, meeting project technical objectives, schedule targets, and budgeted cost targets. Other operational performance improvements include project costing, compared to three years ago, and complying with health and safety standards in construction activities.

The finding echoes similar studies within the supply chain management literature, which argue that KT from supplier development activities, such as training of suppliers' personnel, results in skills and performance improvement of the supplier (Modi and Mabert, 2007; Arráiz, Henríquez and Stucchi, 2013; Gosling *et al.*, 2015; Lawson, Krause and Potter, 2015; Chen, Ellis and Holsapple, 2018). The above finding also partly confirms the results of Modi and Mabert (2007), that through interaction in supplier development, knowledge is demonstrated and transferred, which subsequently leads to performance improvements. The results also corroborate the study on the knowledge-based view theory by Grant (1996), that knowledge is a strategic resource that can result in performance improvements if correctly leveraged. The knowledge-based view theory contends that knowledge is a valuable resource that can lead to the sustainable competitive performance of an organisation, as recent studies show (Giampaoli, Ciambotti and Bontis, 2017; Dang, Le-hoai and Kim, 2018; Ali, Musawir and Ali, 2018; Denford and Ferriss, 2018; Zia, 2020).

Furthermore, Wagner and Krause (2009) report similar findings from the study on the relationship between the buyer KT to the supplier, and supplier performance. Zhang and Lyles (2018) argue that knowledge is a critical resource, and knowledge absorption and application capabilities have a persistent positive impact on operational performance. In supplier development, many studies highlight the impact of supplier development on KT and supplier performance improvement (Wagner and Krause, 2009; Rebolledo, Halley and Nagati, 2009; Rebolledo *et al.*, 2009; Gosling *et al.*, 2015). Therefore, the finding in this study, on the effectiveness of KT on the operational performance of local contractors, is well affirmed in the existing literature on supplier development.

Similarly, the qualitative study reveals that, as a result of KT, local contractors have begun to access the larger scope of work, as opposed to auxiliary works, as was the case in previous years. One expert summarises the effectiveness of KT on operational performance, particularly the 20 per cent subcontracting policy, as indicated in the following quote.

> *"I think in the current state, I would say yes they are working, and we are trying to increase the scope of work, not necessarily focusing on the minor works but also the major scope of work. For instance, I would give you an example of the Lusaka decongestion project. Instead of local contractors focusing on doing road marking and signs, they are now working on actual portions of roads. Therefore, I can say yes, there is knowledge transfer where subcontractors are given a stretch of a kilometre to work on when implementing the 20 per cent initiative"* (EP6).

However, on the other hand, some experts felt that the ISD initiatives had not achieved the empowerment objectives in their current state. Some argue that it is difficult to evaluate them because

there are no set targets and milestones. Besides which, there are no criteria used to measure whether or not ISD initiatives have been successful, as highlighted below:

> *"At the moment, I cannot say that it has helped [Not been effective] because I cannot point to anything that has grown through the 20 per cent subcontracting policy. All I hear are complaints, but then again, when people get the benefits like payments from these projects, nobody comes to tell us that they have been paid. So, it is chaotic, and the arrangement has been chaotic. We have good initiatives; if only we have a proper system, we are going to implement it. However, without a proper system, I doubt whether we will see the results. I think that is where we need to work on."* (EP3).

Based on the above findings, experts proposed some strategies to improve the current implementation of ISD. Among the prominent suggestions is the possibility of encouraging joint ventures between large foreign contractors and local contractors. Experts felt that this would enhance the interaction between the parties, which could, in turn, create a fertile ground for KT in ISD initiatives. Experts argued that the power asymmetry in the 20 per cent subcontracting policy is more skewed to the main contractors and therefore, subcontractors have limited influence on KT.

8.3.4 Objective 4: Mediating role of AC on KT and operational performance

The current study theorises that ISD initiatives in the construction industry are fertile sources of construction knowledge on road construction, project management, road maintenance, supervision skills, designing structures, and occupational health and safety. A local contractor can acquire knowledge through ISD initiatives, and assimilate it by analysing, interpreting, and understanding the acquired knowledge through organisational routines, such as on-site problem solving, training, and employee exchanges between the main contractor and subcontractor. Assimilated knowledge can then be transformed and applied for operational performance improvements (Cohen and Levinthal, 1990; Zahra, and George, 2002; Lane, Koka and Pathak, 2006; Volberda, Foss and Lyles, 2010; Zhang, Zhao and Lyles, 2018). However, the above processes require that a local contractor possess sufficient AC levels to acquire knowledge effectively and assimilate, transform and apply it for performance improvements (Todorova and Durisin, 2007; Ali, Musawir and Ali, 2018; Balle *et al.*, 2020).

The findings from the research study indicate that the different dimensions of AC have varying influences on the relationship between KT and the operational performance of local contractors. Specifically, the findings show that some of the individual dimensions of AC, such as knowledge acquisition, assimilation, and application, do not significantly mediate the relationship between KT and operational performance. However, the results show that knowledge transformation

significantly influences the relationship between KT and operational performance. Furthermore, overall, AC significantly mediates the relationship between KT and operational performance.

Knowledge transformation includes the construction of new routines that can contribute to the creation of new products, services, and processes when new knowledge is assimilated and disseminated within the organisation. For example, Zahra and George (2002) assert that knowledge transformation includes the ability of the company to reform its organisational routines with a view to the subsequent application of that knowledge. As a result, this AC construct is highly visible, which could partly explain its dominance in this study. The research clarifies limited knowledge of how the AC dimensions individually and jointly influence the relationship between KT and operational performance improvement (Ebers and Maurer, 2014; Lawrence, Chan, and James, 2016). The findings demonstrate that the AC dimensions have varied influences on the relationship between KT and operational performance improvement. However, overall, AC mediates the relationship between KT and the operational performance of local contractors.

The preceding results are consistent with the existing literature on AC in supply chain management and supplier development. For example, Arroyo-López, Holmen and de Boer (2012) applied AC as a three-dimensional construct of knowledge acquisition, assimilation and exploitation (application), and generated the result that only knowledge exploitation (application) had a statistically significant effect on financial and operational performance. However, all three dimensions had a statistically significant effect on the development of supplier capability. Furthermore, in the study of the mediating effect of potential and realised AC, using panel data from 250 Chinese high-tech manufacturing organisations, Duan, Wang and Zhou (2020) found that the different dimensions of AC (potential and realised AC) had different effects on innovation. These studies indicate that the different dimensions of AC have different influences on performance outcomes.

Furthermore, since the effect of KT on operational performance dissipates when AC is introduced in the conceptual framework, the result suggests that KT alone is not sufficient to improve the operational performance of local contractors. Therefore, it can be argued in this study that KT is only effective when it is mediated by the overall AC to improve the operational performance of local contractors. In other words, the relationships between KT and the operational performance of local contractors is mediated by overall AC. This finding corroborates the study by Ali, Musawir and Ali. (2018), in a project-based organisational setting, which argues that knowledge sharing does not impact performance directly but rather improves AC, leading to performance improvement.

Firstly, the finding is important to the existing literature and the design of ISD initiatives in the construction industry, which suffer from knowledge discontinuities between and among organisations because of adversarial relationships, transient organisations, and silo operations (Smyth and Duryan, 2020). Secondly, the construction industry is well known to have weak AC, because of the temporary nature of the organisations (Lawrence, Chan and James, 2016; Manley, Rose and Lewis, 2014). Thirdly, the results confirm the findings by Ebers and Maurer (2014) that the effect of AC as a whole is more significant than its dimensions. The findings are also consistent with other studies that have applied AC as a multidimensional construct (Arroyo-López, Holmen and de Boer, 2012; Duan, Wang and Zhou, 2020).

Moreover, the results demonstrate that AC impacts positively on operational performance improvements. This suggests that future engagement of local contractors in ISD initiatives must pay attention to the AC of local contractors. This finding is corroborated by similar studies that suggest that KT improves AC, which in turn improves organisation performance (Liao, Fei and Chen, 2007; Arroyo-López, Holmen and de Boer, 2012; Saenz, Revilla and Knoppen, 2013; Wuryaningrat, 2017; Zhang, Zhao and Lyles, 2018; Ali, Musawir and Ali, 2018).

8.3.5 Objective 5: Moderating role of institutional factors on ISD initiatives and KT

The research study contributes to extant research and institutional theory by demonstrating the influence of regulatory compliance and government support on the relationship between ISD initiatives and KT. Moderation results show that regulatory compliance moderates the relationship between the Preferential scheme and KT and NCC training and KT. Specifically, low regulatory compliance is associated with high KT levels, while high regulatory compliance is associated with low levels of KT. Similarly, the relationship between NCC training and KT is significant for low regulatory compliance, and KT levels decrease with high regulatory compliance. The results are contrary to priori and similar studies in the field that associate compliance with high performance (Gelderman *et al.*, 2006; Mwelu, Davis and Watundu, 2020). However, some plausible explanations have been advanced.

Firstly, it can be inferred that local contractors and SMEs generally regard regulatory compliance issues as a burden and, therefore an obstacle to their operations (Dharam and Singh, 2015; Grandia and Meehan, 2017). Secondly, SME businesses are more severely affected by bureaucracy than large organisations, because they are less proficient at dealing with the complexities of regulatory compliance issues. Thirdly, public procurement is governed by rigid laws and regulations (McKevitt and Davis, 2014; Asamoah, Annan and Rockson, 2019), making interactions between subcontractors highly mechanical. The rigidity of procurement laws stifles free knowledge

sharing, especially tacit knowledge. Tacit knowledge by nature requires high informal interaction between the parties involved (Pérez-Salazar *et al.*, 2017).

In addition to the rigidity of procurement laws and compliance burden, some researchers have questioned the efficacy of regulatory compliance in public procurement. For example, Ibrahim *et al.* (2017) challenge the common assumption that enacting laws and policies will lead to compliance. The relationship between low regulatory compliance and KT could also be attributed to non-compliance with the laws and policies governing ISD initiatives to justify the status quo. These revelations are crucial in designing effective ISD initiatives in the construction industry.

Furthermore, some gaps have been identified in the qualitative findings on the adequacy of regulations and policies for implementing ISD initiatives. The findings are consistent with the study in the Zambian construction industry by Cheelo and Liebenthal (2020), who argue that the implementation of ISD initiatives, such as the 20 per cent subcontracting policy, suffers from a limited and weak regulatory framework. Moreover, Ibrahim *et al.* (2017) opine that the efficacy of the regulatory framework in public procurement policy initiatives is rarely challenged in the literature.

Experts, for example, noted that the implementation of Preferential and Reservation schemes is adversely affected by the loopholes in the pieces of legislation governing ISD initiatives. Experts felt the different laws governing the implementation of ISD initiatives require refinement and harmonisation, as indicated in the quotation below.

> *"If we need to see results, I think we need to harmonise these laws, the NCC Act No. 13 of 2003, CEEC Act No. 9 of 2006, Company's Act No. 10 of 2017 and the Public Procurement Act No 12 of 2008 all these laws need to speak to each other. Legislation should be clear about how empowerment will be done for the Zambians and how technology will transfer skills to the Zambians. You see, there is also a skills levy; it is also talking about the empowerment of Zambians; all these things have to be brought together so that we have a clear line of thinking. It will even help us monitor the progress and see where we are not performing well. However, at the moment, the laws are not clear"* (EP3).

Contrary to regulatory compliance, the relationship between NCC training and KT is consistent at low, moderate, and high levels of government support. The result shows that government support, in the form of information dissemination, provides a stable environment for the exchange of knowledge between the parties involved. Government support is a critical lever in policy implementation of ISD initiatives, particularly those involving the interactions with private sector

players and SMEs (Cai, Jun and Yang, 2010; Harland *et al.*, 2019). Government support in the form of information dissemination reduces the search costs by main contractors or businesses that would want to engage SME businesses in ISD initiatives (Harland *et al.*, 2019).

Qualitative findings also indicate that information dissemination has been effective in informing local contractors about the available ISD initiatives in the construction industry. Experts unanimously agreed that there is adequate information dissemination on the Preferential and Reservation schemes. Experts particularly singled out the RDA and NCC as having played a proactive role in disseminating information on various initiatives in the construction industry, as highlighted in the excerpt below:

> *"In terms of information dissemination, there is a collaboration with RDA. They have been open to us; we have been interacting; we have shared several concerns and proposals with RDA. CEEC somehow has not been proactive; we pursue them to get information. They have not been active in that area, maybe in other sectors such as aquaculture and the likes, but not in the construction industry. However, we have managed to get information because most of the things are related to RDA, they are connected to RDA's procurement, so through RDA, we can pick one or two things"* (EP3).

Finally, the findings on double moderation of regulatory compliance and government support on the relationship between ISD initiatives and KT indicate that the relationship between NCC training and KT is similar at different levels of government support. However, low regulatory compliance is associated with high levels of KT to local contractors, compared to high regulatory compliance.

Furthermore, it is interesting to note that low government support corresponds to relatively low compliance. The finding suggests that if government support is inadequate, it is likely that stakeholders in the industry may not be aware of the various ISD initiatives, let alone comply with the legislation and policies governing them. The results suggest that if the government does not provide sufficient support, in terms of awareness of ISD initiatives to local contractors, there is likely to be low compliance levels by implementing agencies and main contractors. This argument is consistent with the study on the level of compliance with procurement legislation. For example, Ibrahim *et al.* (2017) argue that most procurement legislation has not been effective due to implementation challenges. They recommend addressing those challenges to ensure value for money from ISD initiatives. Patil (2017) also reiterates the critical role of both political players and policy implementers in ensuring effective compliance with SME oriented public procurement policies. As argued earlier, low regulatory compliance could also be attributed to compliance challenges to laws governing ISD initiatives, and this can be exacerbated by low government support.

8.4 Chapter summary

This chapter has discussed the results of both the qualitative and quantitative study findings. The research study has outlined several institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. The factors include political influence, corruption and unfair competition, criteria for participating in ISD initiatives, information dissemination, and inadequate regulatory system. The findings also reveal that the 20 per cent subcontracting policy and NCC training are associated with KT. Furthermore, the study demonstrates that KT is stimulated by ISD initiatives that involve direct interaction between the buying and supplier organisations. However, the Construction Finance Initiative, Preferential, and Reservation schemes, which correspond to indirect ISD initiatives, are not significantly associated with KT.

Furthermore, the findings reveal that the AC of the local contractor is essential in applying knowledge for operational performance. The results show varying mediating influences among the different dimensions of AC. However, the overall AC significantly mediates the relationship between KT and operational performance. The findings also indicate that regulatory compliance moderates the relationship between the Preferential scheme and KT and between NCC training and KT. Furthermore, government support moderates the relationship between NCC training and KT. The findings further show that only regulatory compliance moderates the relationship between NCC training and KT when regulatory compliance and government support are applied simultaneously.

The next chapter presents a summary of the research findings and conclusions and discusses the contribution of the study to theory. The chapter also advances some recommendations, followed by the limitations of the study, and future research avenues are suggested.

CHAPTER 9

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

9.1 Introduction

This chapter summarises the main contents of the previous chapters and discusses the results of both the qualitative and quantitative study findings upon which the conclusions are drawn. The chapter is organised as follows: Section 9.2 presents a summary of the findings. Section 9.3 presents the conclusions of the research study. Section 9.4 discusses the contribution of the study to theory, followed by recommendations in section 9.5. In section 9.6, the limitations of the research and directions for future research are outlined, and section 9.7 presents the chapter summary.

9.2 Summary of the findings

The current study sought to identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. Furthermore, the research established which ISD initiatives (20 per cent subcontracting policy, Preferential and Reservation Schemes, Training and Construction Finance) are associated with KT. Moreover, the research study examined the effect of KT on the operational performance of local contractors. Furthermore, the study investigated the mediating role of AC on the relationship between KT and operational performance and the moderating effect of institutional factors on the relationship between ISD initiatives and KT in the construction industry in Zambia. The study is made up of nine chapters.

In chapter 1, the research setting was presented by outlining the introduction, background, and rationale of the study. Although there is a significant investment in ISD initiatives through SME oriented public procurement policies, it is not yet clear how these initiatives influence KT and the operational performance of local contractors. Literature suggests that the AC of the local contractor can play a vital role in knowledge acquisition, assimilation, transformation, and application. However, this has been underexplored in this context. Furthermore, since ISD initiatives are implemented within the context of SME oriented public procurement policies, institutional factors such as regulatory compliance and government may also influence the implementation of ISD initiatives. However, these factors remain under-researched in ISD initiatives. The study addressed these gaps by firstly identifying the main factors influencing the implementation of ISD initiatives in the construction industry in Zambia. Secondly, by establishing which ISD initiatives are associated with KT and the effect of KT on the operational performance of local contractors. The current research also investigated the mediating role of AC on the relationship between KT and operational

performance, and the moderating role of institutional factors on the relationship between ISD initiatives and KT. The research questions reflect these research objectives.

Chapter 2 unpacked the nexus of supplier development, KT and performance. The research work underlined the importance of KT in supplier development as a panacea for operational performance improvement. Building on a knowledge-based view, the literature argued that knowledge is a valuable strategic resource for the competitive advantage of an organisation that directly contributes to performance improvement. However, there is little evidence of how ISD initiatives can influence performance improvement in the existing literature. The study theorised that AC mediates the relationship between KT and operational performance.

Additionally, the research study theorised that, institutional factors such as regulatory compliance and government support moderate the relationship between ISD initiatives and KT. The study established from the literature that, while the performance of suppliers varies from one programme to another, the operational performance of suppliers converged on quality, delivery, cost reduction, and service. Other measures, such as health and safety, project design, and close-out, are incorporated in the construction industry as key performance indicators. Therefore, considering the above findings and the scarcity of studies on ISD initiatives in the construction industry, the study contributes to understanding which ISD initiatives are associated with KT and, subsequently, the operational performance of local contractors in the construction industry in Zambia.

Chapter 3 focused on the role of public procurement policy in socio-economic development in general and the role of ISD initiatives in particular. The chapter established that Zambia had implemented some ISD initiatives as a means for the capacity building of local contractors, under the umbrella of SME oriented public procurement policies. These are Preferential and Reservation schemes, the 20 per cent subcontracting policy, NCC training of local contractors, and the Construction Finance Initiative. The objective of ISD initiatives is to build a sustainable construction capacity of local contractors through KT.

In chapter 4, the research reviewed the theories underpinning ISD initiatives and KT, which include the knowledge-based view, AC, and institutional theories to address the research objectives. The knowledge-based view theory was adapted from previous studies (Grant, 1996; Modi and Mabert, 2007; Chen, Ellis and Holsapple, 2015; Chen, Ellis and Holsapple, 2018). Furthermore, there is a great deal of emphasis on the importance of AC in supplier development for effective KT. In the current research, Zahra and George (2002), Flatten *et al.* (2011), and Davila *et al.* (2019) guided the conceptual development of the AC as a multidimensional construct. Additionally, the institutional theory argues that the practices and strategies of organisations are influenced by the institutional

context in which they operate (DiMaggio and Powell, 1983). Various intuitional factors influence the implementation of ISD initiatives; hence the institutional theory is critical in this research. The above theories and literature review led to the development of the conceptual framework and the hypothesised relationships, which were tested in chapter 7.

In chapter 5, the study outlined the procedure followed in carrying out the research. The chapter provided the rationale behind the positivist research philosophy adopted after reviewing different philosophical assumptions and the hypothetico-deductive research approach. The current research utilised both exploratory and cross-sectional descriptive survey designs referred to as exploratory-descriptive concurrent design. Consequently, the study applied a mixed-method strategy, involving nine expert interviews and 171 questionnaire responses from the survey of local contractors, to address the research objectives. Furthermore, qualitative data from the nine expert interviews were analysed using NVivo 12. The quantitative data from the survey of 171 local contractors were analysed using the SPSS software version 23 and Hayes PROCESS Macro version 3.4.1. Analytical techniques such as PCA with varimax rotation, reliability analyses using Cronbach's Alpha coefficient, common method variance, nonresponse biases, descriptive statistics, multiple hierarchical regression, mediation, and moderation analyses were employed in data analysis.

Chapter 6 addressed the first objective using qualitative findings from nine expert interviews conducted to identify the main institutional factors influencing the implementation of ISD initiatives in the construction industry in Zambia. The chapter revealed many institutional factors that influence the implementation of ISD initiatives, such as political influence and corruption. Also, the lack of a regulatory framework to guide the 20 per cent subcontracting policy implementation affected its implementation adversely. The findings also established that implementation of the Preferential and Reservation schemes was affected by institutional factors akin to the 20 per cent subcontracting policy, except for a higher impact from fronting. Furthermore, the chapter also revealed that information dissemination was adequate and that local contractors were aware of ISD initiatives.

Chapter 7 addressed the four quantitative research objectives of the study. Results show that NCC training and the 20 per cent subcontracting policy are positively and significantly associated with KT. Secondly, the results ascertained that KT has a positive and significant effect on the operational performance of local contractors. Furthermore, the results indicated that knowledge acquisition, assimilation, and application do not individually mediate the relationship between KT and the operational performance of local contractors. However, knowledge transformation and overall AC mediate the relationship between KT and the operational performance of local contractors.

Additionally, moderation results show that the relationship between the Preferential scheme and KT, and NCC training and KT, is moderated by regulatory compliance. Furthermore, the relationship between NCC training and KT is moderated by government support. The double moderation of regulatory compliance and government support on NCC training and KT is significant for regulatory compliance and not significant for government support.

Chapter 8 discussed the results of both the qualitative and quantitative study findings in the context of existing literature. The research findings thematically addressed the five research objectives. For example, the findings were consistent with existing literature, which argue that direct supplier development activities involving high interaction are associated with KT. Furthermore, findings on the varying mediating effect of AC were consistent with the existing literature. The results confirmed that the effect of AC as a whole is more significant than its dimensions. The findings also indicated that regulatory compliance moderates the relationship between the Preferential scheme and KT and between NCC training and KT. The findings also revealed that government support moderates the relationship between NCC training and KT. The double moderation of regulatory compliance and government support revealed that only regulatory compliance moderates the relationship between NCC training and KT. However, moderation results were contrary to existing literature and reasons for the results were advanced.

Chapter 9 presents an overview of the entire research study. The chapter demonstrates how it addressed the research questions and empirically tested the hypotheses. Furthermore, the chapter discusses the theoretical and policy contributions and recommendations of the study. Finally, the research study highlights the limitations of the research, and future research avenues are suggested based on the limitations of the current study.

9.3 Conclusions

Based on the above, the study makes the following conclusions which are organised according to the research objectives presented in chapter 1. The research questions for the current research work are a direct reflection of the objectives.

9.3.1 Main institutional factors influencing ISD initiatives

Qualitative findings established that the implementation of ISD initiatives are affected by strong political influence and favouritism by politicians, who sometimes exercise extreme power and control over technocrats. Furthermore, it was revealed that corruption is a common feature in the construction industry and contributes to unfair competition between local and foreign contractors. The situation is exacerbated because not only do foreign contractors have access to cheap finance, but some are state-owned enterprises with access to state finance at an almost zero per cent interest

rate. Moreover, the findings indicated that the criteria for engaging local contractors in ISD initiatives are not clear. Consequently, despite being aware of the ISD initiatives, most local contractors do not know how to access them. Furthermore, the study also highlighted inadequate monitoring and evaluation systems as other factors in implementing ISD initiatives. The lack of a robust regulatory compliance system adversely affects the implementation of ISD initiatives. Additionally, the lack of harmonisation between the different pieces of legislation governing ISD initiatives is equally a bottleneck in implementing ISD initiatives. Administrative and business challenges were also acknowledged, including limited finances to mobilise, access to finance, access to equipment, and a lack of construction skills.

9.3.2 ISD initiatives and KT

The research findings confirmed that ISD initiatives, namely the 20 per cent subcontracting policy and NCC training, are significantly associated with KT. In ISD initiatives, third-party initiates training, particularly for SME suppliers. In this study, NCC trains local contractors, through its construction school, in various construction techniques such as road construction and maintenance, project management, supervision skills, designing structures, and occupational health and safety. Training is designed to develop the skills of contractors so that they can participate effectively in various construction projects, in particular public financed projects through ISD initiatives. Subcontracting is another typical ISD initiative used in the public procurement of construction projects to develop supplier capacity. The 20 per cent subcontracting policy and NCC training, which involve high interactions between parties, are commonly referred to as direct supplier development and are significantly associated with KT and, subsequently, operational performance improvement.

However, findings also revealed that the Construction Finance Initiative, Preferential, and Reservation schemes are not significantly associated with KT in the current research. These ISD initiatives comprise indirect supplier development activities such as giving financial bid discounts at the financial evaluation stage, reserving specific contracts (set-asides) for deserving local contractors, and facilitating financial access to local contractors through financial institutions. Even though indirect ISD initiatives contribute to the economic empowerment of the local contractors, there is no evidence of KT and, as a consequence, supplier development. This revelation is essential for redesigning ISD initiatives in the construction industry.

9.3.3 Effect of KT in ISD initiatives

The findings established that KT has a positive influence on the operational performance of local contractors. The finding echoed similar findings within supply chain management, which argues that KT from supplier development activities, such as training of suppliers' personnel, results in skills

and performance improvement of the supplier. Furthermore, the study extends the arguments in the existing literature, that there is a positive association between KT and performance, albeit through the under-explored context of ISD initiatives in the construction industry in the developing country context of Zambia. The findings contribute to the existing knowledge, and the knowledge-based view theory, by confirming that suppliers who can harness knowledge from ISD initiatives can improve their operational performance.

9.3.4 Mediating effect of AC between KT and Operational performance

Regarding the role of AC on the relationship between KT and the operational performance of local contractors, the findings revealed the varying mediating effect of AC dimensions. For example, the findings established that knowledge acquisition, assimilation, and application do not individually have a significant mediating effect on the relationship between KT and the operational performance of local contractors. However, the knowledge transformation and overall AC have a significant mediating effect on the relationship between KT and the operational performance of local contractors. The knowledge transformation dimension encompasses the construction of new routines, leading to the development of new products and processes once new knowledge is assimilated and disseminated throughout the organisation. As a result, this particular AC dimension is highly visible, which could partly explain its dominance in this study. Overall, the effect of KT on the operational performance of local contractors diminishes when AC is added in the conceptual framework. In other words, overall, AC mediates the relationships between KT and the operational performance of local contractors.

9.3.5 Moderating role of institutional factors between ISD initiatives and KT

Moderation results indicated that regulatory compliance moderates the relationship between the Preferential scheme and KT and NCC training and KT. The results also revealed that government support moderates the relationship between NCC training and KT. Specifically, low regulatory compliance is associated with high KT levels, while high regulatory compliance is associated with low levels of KT. Similarly, the relationship between NCC training and KT is significant for low regulatory compliance. SME local contractors regard regulatory compliance issues as a burden to their operations and, therefore, an obstacle to their development. Secondly, local contractors are more severely affected by bureaucracy than are large contractors because they are less proficient at dealing with the complexities of regulation. Furthermore, the relationship between NCC training and KT was consistent at all levels of government support. The result shows that government support, in the form of information dissemination, provides a stable environment for exchanging knowledge between the parties involved. Table 9-1 below summarises the findings.

Table 9-1: Summary of the findings mapped against the research questions

Research question (RQ)	Summary of key findings
RQ.1 What are the main institutional factors influencing the implementation of ISD initiatives?	***Regulatory compliance issues*** • Political influence (political favouritism) • Corruption and unfair competition • Inadequate regulatory system • Fronting • Unclear criteria for participating in ISD initiatives • Administrative, human, and business-related factors ***Government support issues*** • Information dissemination on ISD initiatives • Monitoring and evaluation systems • Training (outdated training, prohibitive costs of accessing training) • Construction Finance Initiative (lack of support from the banking sector).
RQ.2 Which ISD initiatives are associated with KT?	• The findings revealed that the 20 per cent subcontracting policy and NCC training are positively and significantly associated with KT. • The findings also indicated that construction finance, Preferential, and Reservation schemes are not significantly associated with KT. • The findings provide clarity on which ISD initiatives to prioritise with the limited public procurement resource purse.
RQ.3 To what extent does KT affect operational performance?	• KT has a positive influence on the operational performance of local contractors. • The finding echoed similar findings within the supply chain management, which argues that KT from supplier development activities such as training of suppliers' personnel results in skills and performance improvement of the supplier.
RQ.4 Does AC mediate the relationship between KT and operational performance?	• AC dimensions, namely, knowledge acquisition, assimilation, and application, do not significantly mediate the relationship between KT and operational performance. • However, knowledge transformation and overall AC mediate the relationship between KT and operational performance. • The results confirm the findings by Ebers and Maurer (2014) that the effect of overall AC is more significant than its dimensions. • The results are consistent with some findings in the existing literature, albeit from a different context of ISD initiatives in the construction industry, which is characterised by weak AC levels and KT discontinuities because of transient organisations.
RQ.5 Do institutional factors moderate the relationship between ISD initiatives and KT?	• Regulatory compliance has a significant moderating role in the Preferential scheme and NCC training. • For example, low regulatory compliance is associated with high KT levels, while high regulatory compliance with low levels of KT. Similarly, the relationship between NCC training and KT is significant for low regulatory compliance compared with high regulatory compliance. • Government support has a moderating influence on NCC training only. For example, the relationship between NCC training and KT is consistent at all levels of government support. • Government support in information dissemination reduces the search costs by main contractors who want to engage local contractors in ISD initiatives. • Findings on double moderation indicate that the relationship between NCC training and KT is similar at different levels of government support. • However, low regulatory compliance increases KT to local contractors compared to high regulatory compliance.

Source: Researcher (2020)

9.4 Theoretical contributions

Corley and Gioia (2011) assert that the critical dimensions to theoretical contribution in management and organisational studies are (1) originality of the research in terms of advancing understanding and revelation and (2) utility, which constitutes the practical and scientific use of the findings. Based on this argument, the findings from this research work make theoretical and practical contributions to the existing literature on supplier development and ISD initiatives as follows.

Firstly, existing literature suggests that direct supplier development activities involving high interactions are associated with KT (Modi and Mabert, 2007; Wagner, 2010; Arroyo-López, Holmen and de Boer, 2012; Grandinetti, 2016; Smyth and Duryan, 2020). This research study advances the current knowledge, using the knowledge-based view theory, by extending findings from the private sector context to public procurement and the use of ISD initiatives in the construction industry. The study has empirically demonstrated that only the 20 per cent subcontracting policy and NCC training are significantly associated with KT. However, the Preferential scheme, Reservation scheme, and Construction Finance Initiative are not significantly associated with KT.

A report of the Committee on Communications, Transport, Works and Supply of the National Assembly of Zambia, on ISD initiatives related to the participation of local contractors, found that the lack of empirical research in the construction industry was a significant challenge in the development of policy interventions (GRZ, 2014). The findings in this study provide a basis on which to prioritise the implementation and funding of ISD initiatives because the government and other public institutions are continually operating on a limited public procurement budget. The 20 per cent subcontracting policy and NCC training need to be prioritised as the main ISD initiatives that stimulate KT.

Secondly, using the AC theory, the research clarifies the limited knowledge of how the AC dimensions individually and jointly influence the relationship between KT and operational performance improvement (Ebers and Maurer, 2014; Lawrence, Chan, and James, 2016). Another significant contribution is the confirmation that, overall, AC influences the relationship between KT and operational performance more than its dimensions (Arroyo-López, Holmen and de Boer, 2012; Ebers and Maurer, 2014; Duan, Wang and Zhou, 2020). The research study contributes to the AC theory by demonstrating that the effect of KT on operational performance diminishes when AC is added to the conceptual framework. As a result, the study reveals that KT alone is not sufficient to improve the operational performance of local contractors in the construction industry. In order to contextualise the preceding discussion, the study has demonstrated that AC may enable local contractors to obtain external knowledge from ISD initiatives, such as the 20 per cent subcontracting

policy and NCC training, which are integrated with existing knowledge in order to improve their operational performance.

Thirdly, using the institutional theory, this research demonstrates the moderating role of institutional factors, namely regulatory compliance, and government support, on the relationship between ISD initiatives and KT. The study established the significant moderating role of regulatory compliance on KT for the Preferential scheme and NCC training. However, there was no significant moderating role of regulatory compliance on KT for the 20 per cent subcontracting policy, Reservation scheme, and the Construction Finance Initiative. Explicitly, the study empirically confirmed that low regulatory compliance is associated with high KT levels, while high regulatory compliance is associated with low levels of KT, for the Preferential scheme and NCC training.

Regulatory compliance to laws and policies governing the implementation of ISD initiatives, such as the CEEC Act No. 9 of 2006 on Preferential and Reservation schemes, the NCC Act No. 13 of 2003 on NCC training, and the 20 per cent subcontracting policy, are critical in ensuring effective KT. The current qualitative findings partly indicate that regulatory compliance with laws and policies governing ISD initiatives has not been satisfactory. The qualitative findings corroborate the quantitative results, which reveal that only 2 out of 5 ISD initiatives (i.e. Preferential scheme and NCC training) are moderated by regulatory compliance.

These findings can be partly attributed to unsatisfactory regulatory compliance. For example, Ibrahim *et al.* (2017) rightly attribute the state of compliance with public procurement laws as window dressing. In their research article on the public procurement legal regime and compliance levels, they conclude that compliance is mostly a façade without translation into value for money. The current research study, therefore, extends these arguments using an institutional theory and affirms the need to comply with the regulatory regime that guides the implementation of ISD initiatives to ensure effective KT.

The study also demonstrates that the relationship between NCC training and KT is consistent at all levels of government support. In the form of information dissemination, government support reduces the search costs by the main contractor that would want to engage subcontractors in ISD initiatives (Harland *et al.*, 2019). The arguments advanced above are premised on the fact that ISD initiatives are implemented in public procurement policy. As a consequence, they are influenced by institutional factors that govern public procurement.

9.5 Recommendations

The recommendations of this research work should be of interest to both the high-level managers of construction companies in the industry and policymakers, which comprises mainly the government and its quasi-institutions responsible for designing and implementing ISD initiatives. Firstly, the NCC training of local contractors must be made compulsory and affordable to local contractors interested in ISD initiatives. However, the current practice of NCC training is voluntary and relatively costly to start-up local contractors. By subsidising the cost of training local contractors, the government will encourage those local contractors who are already in business to improve their knowledge and skills and subsequently increase their competitiveness through the development of AC. This approach, in turn, is envisaged to improve and stabilise the already-established commercial linkages in the construction industry. For example, only local contractors who have undergone compulsory training should be allowed access to ISD initiatives. Compulsory training will also protect public entities and main contractors from awarding contracts to less-qualified local contractors that might default and defeat the ISD initiatives' objective. The argument is premised on the fact that NCC training is significantly associated with KT in the construction industry.

Secondly, the 20 per cent subcontracting policy is another ISD initiative associated with KT in the current research. Currently, the 20 per cent subcontracting policy has no legal framework, which has created implementation challenges as highlighted by experts during the qualitative study. Therefore, the government should consider implementing binding legislation on projects financed entirely by the government to support the implementation of the 20 per cent subcontracting policy as a critical ISD initiative that stimulates KT. The main emphasis on binding mandatory subcontracting obligations, on the part of the main contractor is to ensure certain levels of assurance that, after the award of a contract, part of the scope of work can be subcontracted to local contractors. Legislation should compel main contractors to certify that they will use the local subcontractors designated in their proposals at the time of submitting a tender unless the subcontractors cannot perform. Subcontracting can, in turn, facilitate local contractors' access to public construction contracts which can stimulate KT. Binding legislation on the 20 per cent subcontracting policy can also ensure that subcontractors are engaged before the contract award because the main contractor and the subcontractor will be required to bid for contracts together. However, legal interventions are currently lacking in implementing the 20 per cent subcontracting policy in Zambia.

A key theme, which can be traced in the first and second recommendations mentioned, is the extent to which ISD initiatives are associated with KT and, subsequently, the operational performance of local contractors. Only 2 out of 5 ISD initiatives, namely the 20 per cent subcontracting policy and

NCC training, are associated with KT. Concerning the objectives of these initiatives, managers and policymakers should therefore prioritise these ISD initiatives in light of the continually limited public procurement resource purse.

Thirdly, the study points out that AC is an important consideration when engaging local contractors in ISD initiatives. Assessing local contractors' AC before participating in ISD initiatives should be a prerequisite for all local contractors. AC assessment will ensure high chances of knowledge acquisition, assimilation, transformation, and application, as opposed to current practices, where everyone can participate as long as local contractors are registered with the NCC. Local contractors who have developed more excellent AC would be better positioned to take advantage of knowledge from the ISD initiatives to improve their operational performance. Preliminary assessments and NCC training are the two ways of enhancing and assessing the AC of local contractors. Local contractors who do not pass the preliminary assessment should be referred to the NCC construction school programme for mandatory training and certification. The first preliminary assessment practice is essential and should be used to capture the AC of local contractors.

Fourthly, in the context of public procurement, there is a need to emphasise the dual role of public procurement regarding primary and secondary objectives. For example, while it is critical to comply with procurement laws, it is equally essential to ensure that compliance translates into the achievement of procurement objectives such as value for money and the empowerment of SMEs. It is, therefore, essential to address the implementation challenges of ISD initiatives in public procurement. These include ensuring that the various laws governing ISD initiatives, such as the NCC Act No. 13 of 2003, CEEC Act No. 9 of 2006, Company's Act No. 10 of 2017, and the Public Procurement Act No 12 of 2008, and other policies are consistent on the definition of a citizen and local company. The research study proposes a clear distinction between citizen contractors (i.e. companies wholly owned by citizens) and local contractors (i.e. partnerships between citizens or non-indigenous Zambians) to be considered in future revised legislation and policies.

Finally, based on the qualitative findings and to increase the level of compliance for implementing the Preferential and Reservation schemes. It is necessary to establish procuring entity ratings based on the successful application of the Preferential and Reservation schemes. Therefore, procuring entities that effectively apply the schemes should score points that can be incorporated into their key performance indicators. Incentivising procuring entities as implementers of Preferential and Reservation schemes is likely to improve their application and compliance with legislation governing the two initiatives.

Furthermore, there is a need to establish systems for data capture on ISD initiatives to track progress and intervention mechanisms. Currently, no specific institution monitors the implementation of ISD initiatives, which makes progress reporting haphazard or nonexistence. Data capturing on how local contractors benefit from the initiatives, the specific contracts executed per year, and progress on the NCC grading system will help policymakers evaluate the impact of the initiatives.

9.6 Limitations and directions for future research

Despite the contributions made by the current research, it is not void of limitations that provide exciting future research avenues.

Firstly, the sampling frame consists of 1,649 contractors from the Lusaka and Copperbelt provinces, accounting for 57 per cent of all registered contractors in Zambia. Lusaka is the capital city of Zambia, while the Copperbelt Province, on the other hand, is the economic hub of the country due to the concentration of mining activities there. Thus, the two selected provinces have the highest concentration of economic and construction activities in Zambia and reasonably represent the construction industry in Zambia. However, even though this is a fair representation of the construction companies in Zambia, future studies may need to consider all 10 provinces, including rural areas, to verify if similar findings can be replicated.

Secondly, one principal respondent from each of the local construction companies provided the data for the current study. Having single respondents with self-reported questionnaires at a single point in time, raises concerns of common method bias (Podsakoff *et al.*, 2003; Mackenzie and Podsakoff, 2012). In order to address the common method of bias limitation, the questionnaire was designed in such a way that independent and dependent variables were placed at two extreme ends of the questionnaire, to reduce the effects of the consistency of the artefacts (Tehseen *et al.*, 2017). Furthermore, Harman's one-factor test was used to evaluate the possibility of common method bias (Podsakoff *et al.*, 2003). An examination of unrotated factor loadings indicated that factor 1 accounted for only 26.5 per cent of the variance from the cumulative percentage of 74.9 per cent. The result implies that no single factor dominated the variance explained in the data, and common method bias is not a problem in the current research (Podsakoff *et al.*, 2003; Tehseen, Ramayah and Sajilan, 2017).

Thirdly, the research study conducted a cross-sectional survey; therefore, it cannot establish causality among variables over time. Causality and changes among variables over time can only be established through a longitudinal study. Since institutional factors and AC evolve, future research can consider a longitudinal study to observe the evolution of these factors over time. Future studies

should keenly observe the impact of institutional factors and AC on KT, and operational performance over time.

Furthermore, conducting in-depth longitudinal case studies on local construction companies that have benefitted from ISD initiatives; obtaining survey or case data from main contractors and subcontractors on KT, AC, and operational performance can provide more insights into the findings. Additionally, future studies may use secondary data as indicators of subcontractor performance from NCC and develop new constructs that could be used in future modelling.

Fourthly, this study collected data through a questionnaire on ISD initiatives focusing on SME local contractors in grades 3, 4, 5 and 6 in the construction industry in Zambia. The research highlights an essential caveat that findings may not be generalised to large contractors in the industry, especially in developed countries, because of significant contextual differences. In order to increase the external validity of this study, future research studies should extend the sampling framework to cover various large and SME contractors in multiple countries, where feasible.

9.7 Chapter summary

The current research study has addressed the research gaps in ISD initiatives in the construction industry, primarily by offering alternate empirical and theoretical perspectives to inform policy and practice. The study used a mixed-method strategy to address the research objectives and was underpinned by the knowledge-based view, AC, and institutional theories. This research has empirically demonstrated that the 20 per cent subcontracting policy and NCC training are associated with KT.

Moreover, the study contributes to the AC theory by demonstrating that the effect of KT on operational performance diminishes when AC is introduced in the conceptual framework. The finding reveals that KT alone is not sufficient to improve the operational performance of local contractors in the construction industry. Moreover, using the institutional theory, the study also demonstrates the moderating role of institutional factors, namely regulatory compliance and government support, on the relationship between ISD initiatives and KT. Explicitly, the research study empirically confirmed that low regulatory compliance is associated with high KT levels, while high regulatory compliance is associated with low levels of KT for the Preferential scheme and NCC training. However, the study also demonstrates that the relationship between NCC training and KT is consistent at all levels of government support.

Furthermore, the research has provided a number of recommendations to both high-level management of construction companies and policymakers. Regarding the objectives of these

initiatives, managers and policymakers should prioritise the 20 per cent subcontracting and NCC training, which stimulate KT, in light of the continually limited public procurement resource purse. Furthermore, the NCC training of local contractors must be compulsory and affordable for local contractors interested in participating in ISD initiatives. Secondly, the government should consider enacting binding legislation on projects financed entirely by the government, to support the implementation of the 20 per cent subcontracting, which is a key ISD initiative for stimulating KT. Moreover, the research study points out that AC is an important consideration when engaging local contractors in ISD initiatives. Assessing local contractors' AC before participating in ISD initiatives should be a prerequisite for all local contractors. Additionally, in the context of public procurement, there is a need to emphasise the dual role of public procurement regarding the achievement of procurement objectives such as value for money and the empowerment of SMEs. Finally, procuring entity ratings should be established, based on the successful application of the Preferential and Reservation schemes.

Despite the contributions made by the current research, the research study acknowledges limitations that provide exciting future research avenues. Firstly, even though the study covered a fair representation of the construction companies in Zambia, future studies may consider all of the 10 provinces, including rural areas, to verify if similar findings can be reproduced. Secondly, using single respondent and self-reported questionnaires raises concerns of common method bias at a single point in time; however, prior and post data collection remedies were applied to address the common method bias. Thirdly, future studies should keenly observe the impact of institutional factors and AC on KT, and operational performance over time. Fourthly, the study highlights an essential caveat that, because only SME local contractors were involved in the study, findings may not be generalised to large contractors in the industry, especially in developed countries, because of significant contextual differences.

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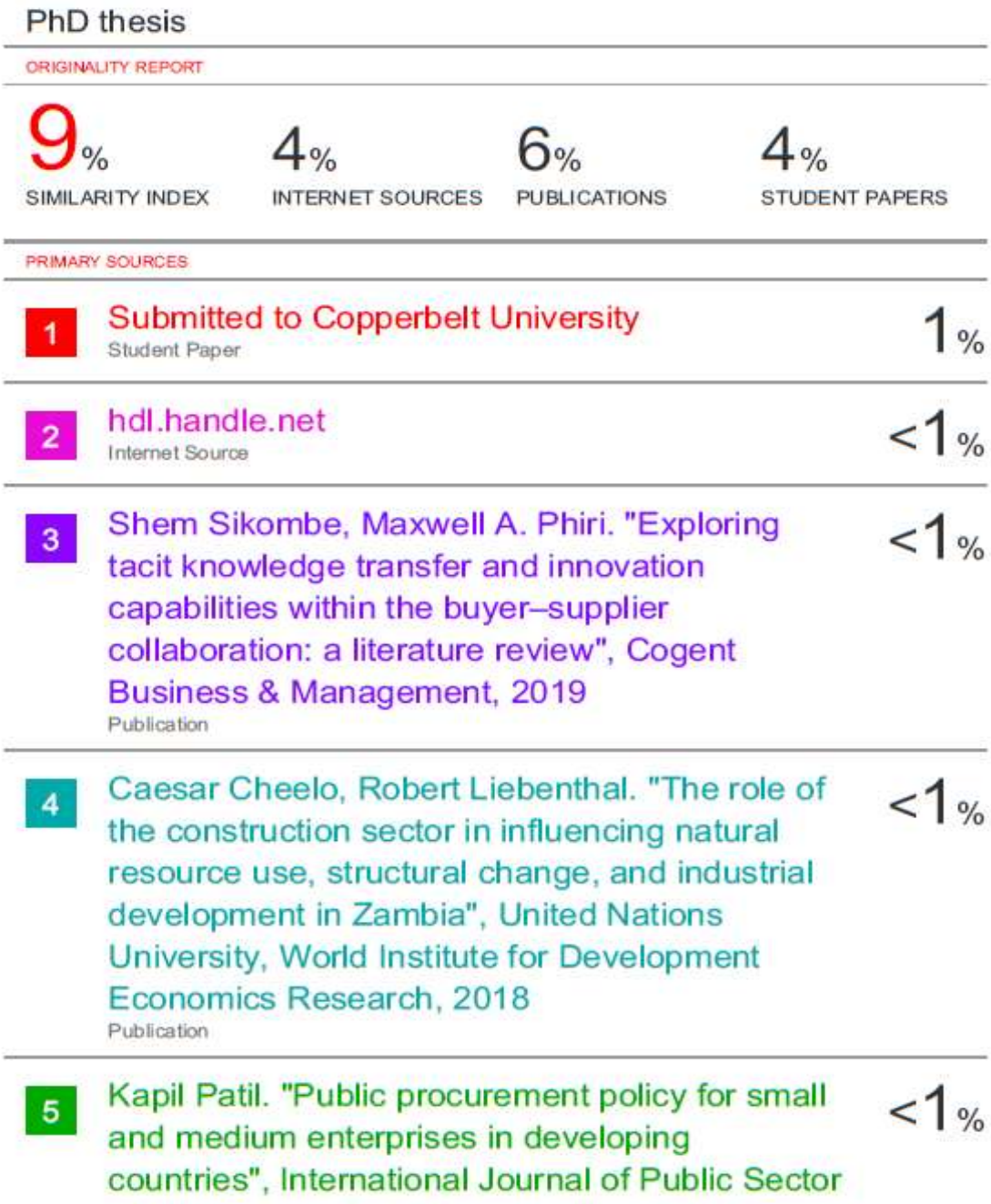
APPENDICES

Appendix I: Turnitin report (first page)



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5	Kapil Patil. "Public procurement policy for small and medium enterprises in developing countries", International Journal of Public Sector	<1%

Appendix II: Language Editor Letter

iiTranslation PTY LTD

+27-21-685-2383
C14, Ambleside, Lower Hope Road, Rosebank,
Cape Town, Western Cape, 7700
www.iitranslation.com
info@iitranslation.com

I, Adam Sadian confirm that the editorial was undertaken by a qualified editor **(BSc, Rhodes University) (BSc, UCT) (MSc (Energy Studies), UCT)** fluent in **English** has editied the following document(s) to the best of their ability. Their CV is kept on file by the iiTranslation Company and will be available on request with academic certificates.

Document(s) (list):
PhD thesis Shem Sikombe 217080939 -Final report 9th Nov 2020

Signature: [redacted]
Print Name: Mr AK Sadian, **Director iiTranslation Pty Ltd**

18 November 2020
Date

Appendix III: Ethical clearance approval letter

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

19 November 2019

Mr Shem Sikombe (217080939)
School Of Man Info Tech &Gov
Westville Campus

Dear Mr Sikombe,

Protocol reference number: HSSREC/00000717/2019
Project title: Knowledge Transfer in Institutionalised Supplier Development and Organisational Performance: Evidence from the Construction Industry in Zambia

Full Approval – Expedited Application

This letter serves to notify you that your application received on 28 October 2019 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid for one year from 19 November 2019.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

Yours sincerely,

[redacted]

Professor Urmilla Bob
University Dean of Research

/dd

Appendix IV: Publications / Research Articles emerging from the research study.

Research questions	Paper title	Status	Publisher
(Literature review)	Sikombe, S and Phiri, A., M. (2019) Exploring tacit knowledge transfer and innovation capabilities within the buyer-supplier collaboration: a literature review, *Cogent Business & Management*, 6:1 https://doi.org/10.1080/23311975.2019.1683130	Published	Taylor and Francis
RQ.1	Shem Sikombe & Maxwell A. Phiri | (2021) Institutional factors influencing institutionalised supplier development initiatives in the construction industry in Zambia, Cogent Business & Management, 8:1, https://doi.org/10.1080/23311975.2021.1935184	Published	Taylor and Francis
RQ.2 and 3	Shem Sikombe & Maxwell Phiri (2021): How do institutionalized supplier development initiatives affect knowledge transfer and operational performance? Evidence from SME construction companies in Zambia, African Journal of Science, Technology, Innovation and Development, https://doi.org/10.1080/20421338.2021.1889757	Published	Emerald Publishing
RQ. 5	Sikombe, S and Phiri, A., M. (2021) 'Knowledge transfer in institutionalised supplier development initiatives: The moderating role of institutional factors' *Int. J. Procurement Management, Vol. 14, No. 5, 2021*	Published	Inderscience Enterprises Ltd.
RQ 4	Knowledge Transfer in Institutionalised Supplier Development and Operational Performance: The Mediating Role of Absorptive Capacity	Under peer review	

Appendix V: Qualitative data analysis

Summary of interview findings		Expert IDs									
		EP1	**EP 2**	**EP 3**	**EP 4**	**EP 5**	**EP 6**	**EP 7**	**EP 8**	**EP 9**	**Total**
What are the main institutional factors that influence the implementation of ISD initiatives in the construction industry in Zambia?											
1	**Institutional factors affecting the 20 per cent subcontracting policy**										
	Political influence	✓		✓	✓			✓		✓	5
	Criteria for participating in the 20per cent initiatives	✓		✓	✓				✓	✓	5
	Information dissemination on the 20 per cent initiative		✓	✓	✓	✓	✓	✓	✓	✓	8
	Corruption and unfair competition			✓	✓	✓	✓	✓	✓	✓	7
	Monitoring and evaluation systems	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
	Robustness of the regulatory system	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
	Institutional challenges on 20per cent policy implementation	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
2	**Institutional factors affecting Preferential and Reservation schemes**										
	Fronting	✓	✓	✓	✓	✓		✓	✓	✓	8
	Information dissemination on the Preferential and Reservation schemes		✓	✓	✓			✓	✓	✓	6
	Corruption and unfair competition	✓		✓	✓			✓		✓	5
	Monitoring and evaluation systems	✓	✓	✓	✓			✓	✓	✓	7
	Robustness of the regulatory system	✓	✓	✓	✓	✓			✓	✓	7
	Institutional challenges on Preferential and Reservation schemes implementation	✓	✓	✓	✓	✓		✓	✓	✓	8
3	**NCC Training model for contractors**			✓						✓	2
4	**Construction financing model**	✓	✓	✓					✓	✓	5

Appendix VI: Normality, homoscedasticity, and linearity tests

Skewness and kurtosis indices are within acceptable limits of ±2 (Field, 2009).

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Subcontracting	171	1.00	5.00	2.7825	1.07437	-.106	.186	-1.072	.369
Reservation	171	1.00	5.00	2.7942	1.03297	.112	.186	-.786	.369
Preferential	171	1.00	5.00	2.7222	1.03910	-.028	.186	-.681	.369
Training	171	1.00	5.00	3.1915	1.06596	-.609	.186	-.341	.369
Construction fin.	171	1.00	5.00	1.7719	.98184	1.269	.186	1.090	.369
Acquisition	171	1.00	5.00	3.9084	.76358	-1.360	.186	3.333	.369
Assimilation	171	1.00	5.00	3.8908	.70185	-.719	.186	1.306	.369
Transformation	171	1.00	5.00	4.0886	.65045	-1.293	.186	3.257	.369
Application	171	1.00	5.00	3.5819	.78909	-.713	.186	.932	.369
Regulatory comp.	171	1.00	5.00	2.4351	1.04225	.456	.186	-.441	.369
Government sup.	171	1.00	5.00	2.6404	.92277	-.043	.186	-.412	.369
Knowledge transf.	171	1.00	5.00	3.4279	1.00310	-.607	.186	-.065	.369
Performance	171	1.00	5.00	4.1793	.75277	-1.437	.186	2.628	.369
Valid N (listwise)	171								

Hierarchical multiple regression model

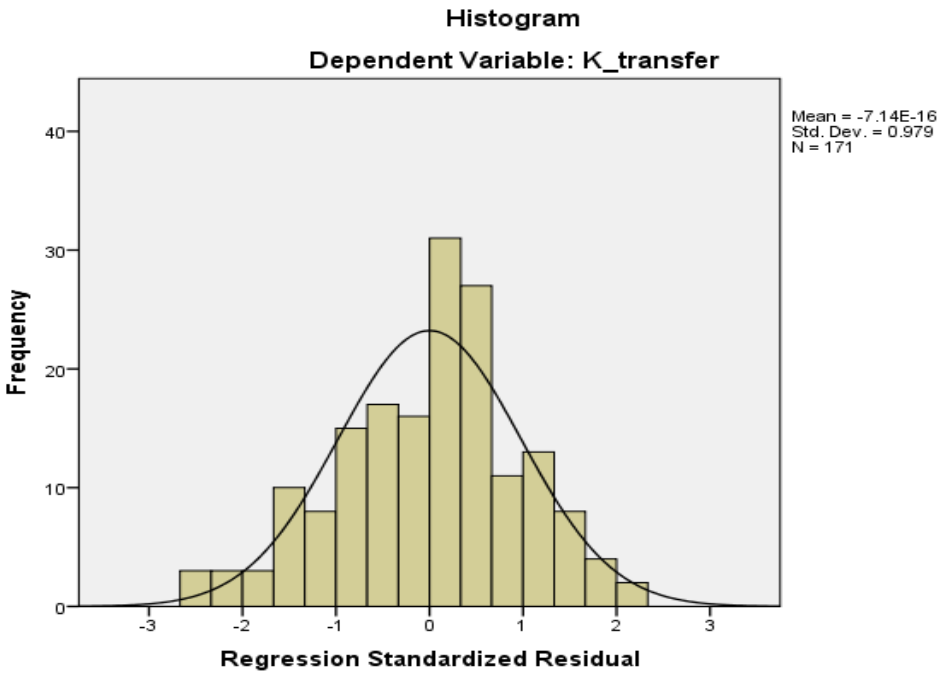
Independent variables: 20 per cent subcontracting policy, Reservation scheme, Preferential scheme, NCC training and Construction Finance Initiative
Dependent variable: Knowledge transfer

Model Summary

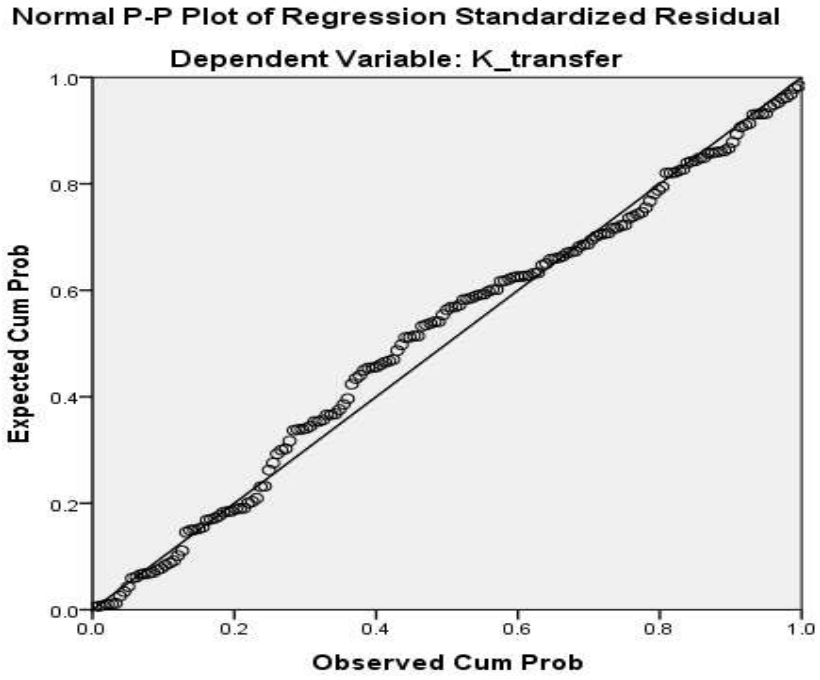
					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.130[a]	.017	.005	1.00054	.017	1.436	2	168	.241	
2	.471[b]	.222	.189	.90360	.205	8.596	5	163	.000	1.935

a. Predictors: (Constant), No_of_employees, Company_age
b. Predictors: (Constant), No_of_employees, Company_age, Reserv, NCC_train, Prefere, Const_fin, Subcon
c. Dependent Variable: K_transfer

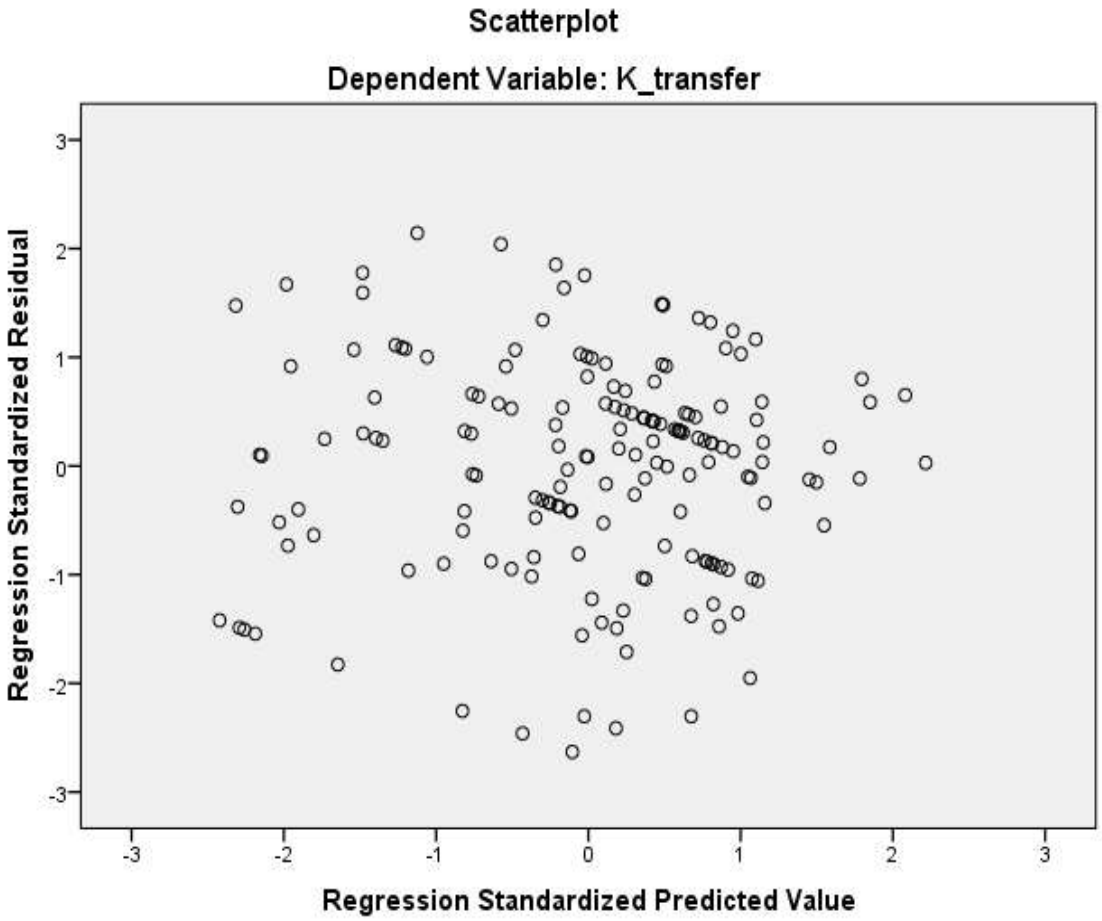
Note: Durban-Watson of 1.935 indicates that autocorrelations are not a serious problem in the data.



The histogram distribution indicates that the data reasonably normally distributed indicated that the normality assumption had been met.

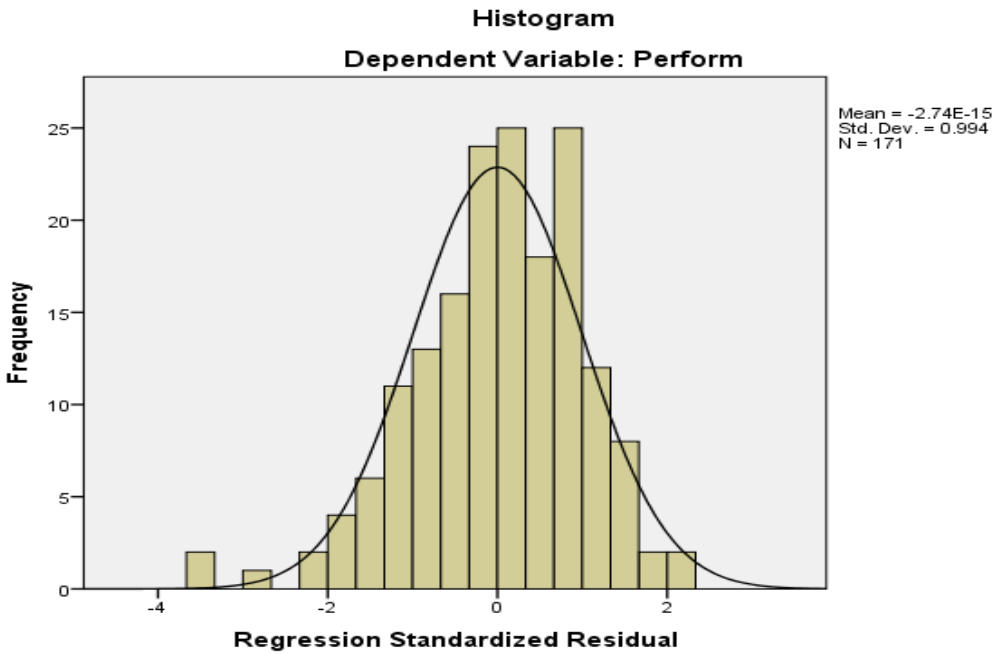


The P-P plot indicates that data exhibits linearity and normality because the dashed line does not deviate much from the straight line (which indicates a reasonable normally distributed errors)

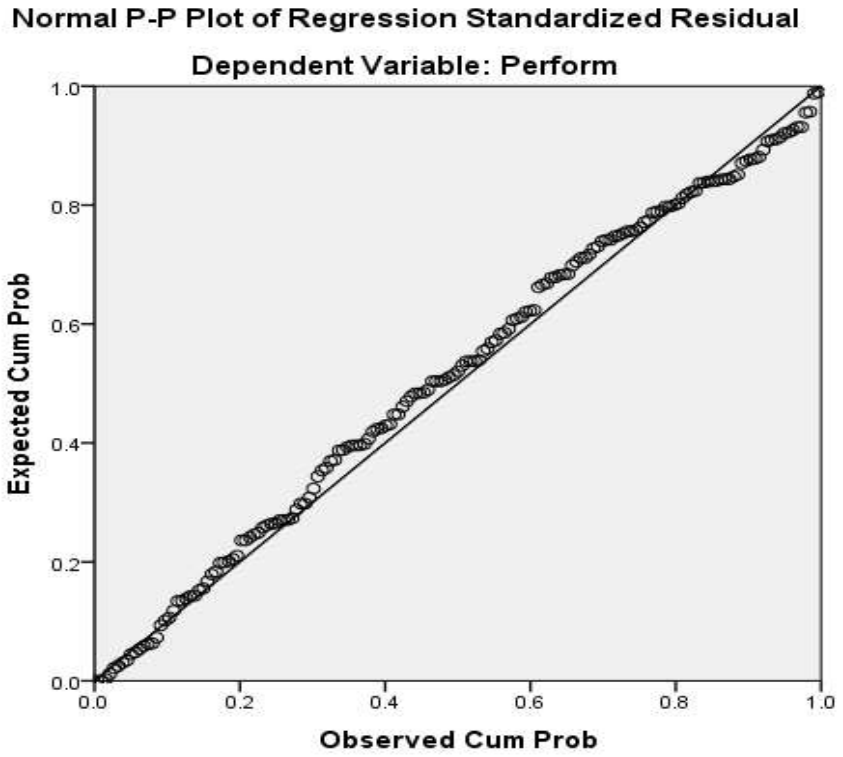


The scatterplot of ZPRED vs ZREDID indicates that data is approximately centred around zero; therefore, homogeneity and homoscedasticity is not a problem. The Durbin-Watson statistic also falls within the recommended boundaries of 1-3(Field, 2009), which suggests that errors are reasonably independent.

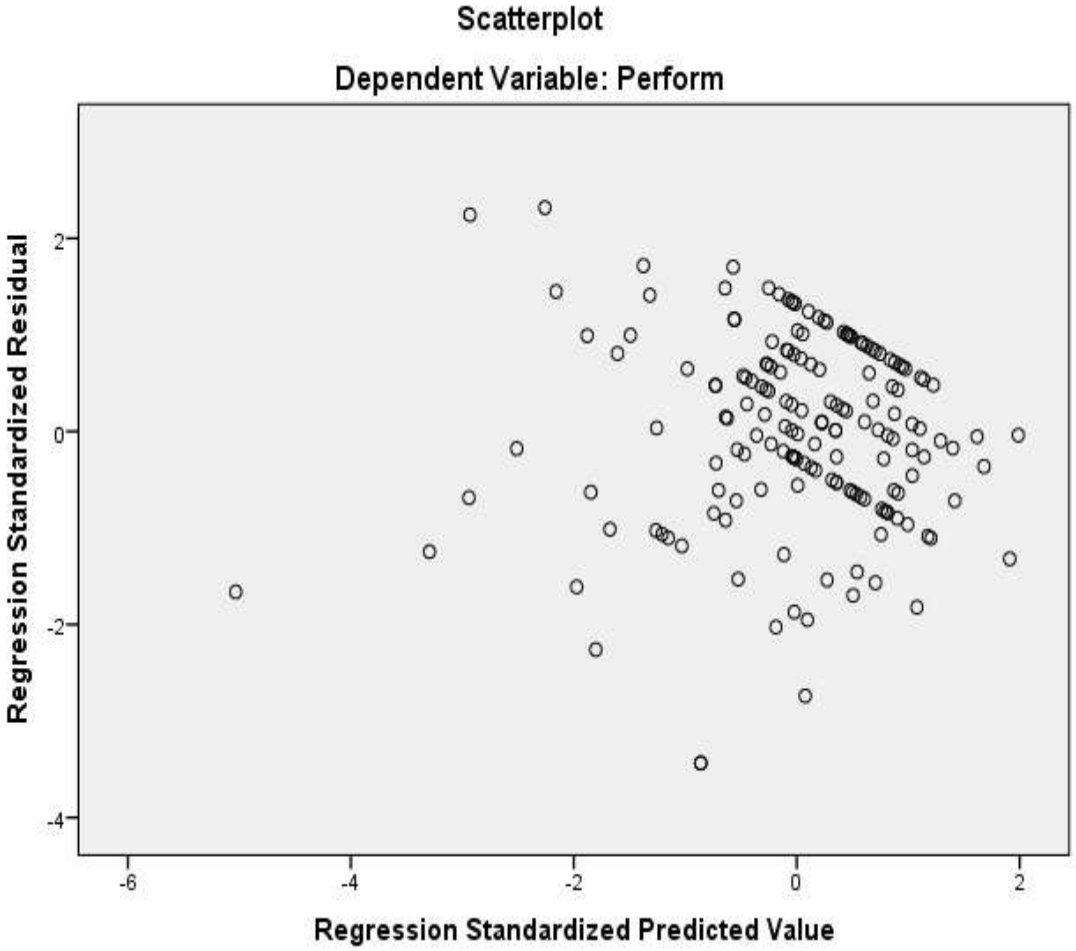
Independent variables: Knowledge transfer and Absorptive capacity



The histogram distribution indicates that the data approximately normally distributed



The P-P plot indicates that data exhibits linearity



The ZPRED vs ZREDID indicates that data is approximately centred around zero. Therefore, homogeneity and homoscedasticity are not a problem

Appendix VII: Questionnaire survey for contractors

UNIVERSITY OF KWAZULU-NATAL

Survey Questionnaire

Greetings,

My name is Shem Sikombe; I am a PhD student at the University of KwaZulu-Natal, Westville Campus in South Africa and a Lecturer at the Copperbelt University, School of Business, P.o. Box 21692, Kitwe, Mobile: +260972178094/+260953360700 Email: 217080939@stu.ukzn.ac.za or shem.sikombe@cbu.ac.zm

You are being invited to consider participating in a research project entitled: **Knowledge transfer in institutionalised supplier development and organisational performance: evidence from the construction industry in Zambia.** The purpose of this research is to investigate how Government initiatives such as Preferential and Reservation schemes, training by the NCC, the 20 per cent mandatory sub-contracting policy and Construction Finance Initiative have contributed to contractor performance. We hope that the study will provide the much-needed clarity on the effectiveness of these initiatives and offer policymakers an opportunity to reflect upon existing support to local contractors and how future support can be aligned with local contractors' needs.

The study involves no known risks and/or discomforts beyond those encountered in everyday life. The duration of your participation, if you agree to participate and remain in the study, is expected to be 20 minutes. This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number **HSSREC/00000717/2019**). In the event of any problems or concerns/questions, you may contact the researcher using the addresses above or the UKZN Humanities & Social Sciences Research Ethics Committee, on the following contact details:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001
Durban 4000 KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary, and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequences. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance and your responses will not be used for any purposes outside of this study.

All data, both electronic and hard copy, will be securely stored during the study and archived for five (5) years. After this time, all data will be destroyed. If you have any questions or concerns about participating in the study, please contact my research supervisor at the numbers listed above or me.

Sincerely

Shem Sikombe

Instructions to respondents

To participate in this research, the construction company should have benefited from any of the Government initiatives such as ***Reservation or Preferential schemes, training by the National Council for Construction, 20 per cent mandatory sub-contracting policy and Construction Finance Initiative.*** *Please answer the questions in the questionnaire by crossing (☒) in the relevant box or writing down your answer in the spaces provided. For example:*

Kindly indicate your gender		
Female	1	☒
Male	2	☐

Section A: Background Information

1. Name of your company……..……. The number of years in operation.....
2. Please indicate your gender

Female	1	☐
Male	2	☐

3. Kindly indicate your position in the company?

Owner	1	☐
CEO/Director/Senior manager	2	☐
Others, please specify……	3	☐

4. How long have you been working for or running this company?

1 year and below	1	☐
2 to 4 years	2	☐
5 to 7 years	3	☐
7 to 9 years	4	☐
Over 10 years	5	☐

5. Kindly indicate your highest qualification?

Primary certificate	1	☐
Secondary certificate	2	☐

College certificate/diploma	3	☐
Bachelor's degree	4	☐
Others, please specify…….	5	☐

6. What category/subsector is your company in?

Category B-General Building and Housing	1	☐
Category C-General Civil Engineering Works	2	☐
Category R-General Roads and Earth Works	3	☐
Category ME-Mechanical Engineering Works	4	☐
Others, please specify……	5	☐

7. What NCC grade does your company fall in?

Grade 3	1	☐
Grade 4	2	☐
Grade 5	3	☐
Grade 6	4	☐

8. How many workers have you employed on average?

Below 25	1	☐
26 to 50	2	☐
51 to 75	3	☐
76 and above	4	☐

9. Please indicate the type of ownership for your business?

Single ownership (sole trader)	1	☐
Family business	2	☐
Partnership (state how many)	3	☐
Private limited company	4	☐
Other, please specify…….	5	☐

Section B: Types of Government coordinated local contractor development initiatives

10. Please indicate the initiative (s) your company has benefited from in the last 3 years, where 1-Yes and 2-No

	Government initiative	1	2
10a	CEEC Preferential scheme	☐	☐
10b	CEEC Reservation scheme	☐	☐
10c	NCC training/capacity building	☐	☐
10d	20 per cent mandatory subcontracting policy	☐	☐
10e	Construction Finance Initiative	☐	☐
10f	Others, please specify……		

11. Please indicate how frequent your company participates in the following Government initiatives (on a scale between 1 to 4, where 1= Never (N), 2= Sometimes, e.g. once a year (S), 3= Frequently, e.g. Twice a year (F) and 4= Very frequent, e.g. Quarterly (VF))

	Government initiative	1	2	3	4
11a	CEEC Preferential scheme	☐	☐	☐	☐
11b	CEEC Reservation scheme	☐	☐	☐	☐
11c	NCC training/capacity building	☐	☐	☐	☐
11d	20 per cent mandatory subcontracting policy	☐	☐	☐	☐
11e	Construction Finance Initiative	☐	☐	☐	☐
11f	Others, please specify……...				

12. What type of support does your company need most (1-never needed (NE), 2-not needed (NN), 3-neutral (NT) 4-needed (N), 5-highly needed (HN))?

	Type of support needed most by your company	1	2	3	4	5
12a	Support to improve quality	☐	☐	☐	☐	☐
12b	Technological and engineering support	☐	☐	☐	☐	☐
12c	Access to finance	☐	☐	☐	☐	☐
12d	Training for employees	☐	☐	☐	☐	☐
12e	Support to improve communication and marketing strategy (reaching out to new projects or contracts)	☐	☐	☐	☐	☐
12f	Others, please specify……					

Section C: Government coordinated local contractor development initiatives

13. Please indicate the extent to which you agree with the following statements regarding government initiatives (where 1= Strongly Disagree (SD) 2= Disagree (D) 3= Neutral (N) 4= Agree (A) and 5= strongly agree (SA)).

	Through the 20per cent mandatory subcontracting policy:	**1**	**2**	**3**	**4**	**5**
13a	My client promised more contracts to be subcontracted to my company for improving current performance.	☐	☐	☐	☐	☐
13b	My client and my company engage in consultations while on the project site	☐	☐	☐	☐	☐
13c	My client unbundles contracts into appropriate sizes to accommodate small local contractors like my company.	☐	☐	☐	☐	☐
13d	My client provided my company technical assistants whenever needed	☐	☐	☐	☐	☐
13d	My client assessed my company's performance through a formal evaluation system with established guidelines and procedures.	☐	☐	☐	☐	☐
	Through Reservation schemes:	**1**	**2**	**3**	**4**	**5**
13e	Government institutions reserve specific contracts for companies like ours, based on the prescribed criteria.	☐	☐	☐	☐	☐
13f	In my opinion, only companies that meet a specified requirement as provided for by the law participate in reserved contracts.	☐	☐	☐	☐	☐
13g	Government institutions ensure that contracts below K30 million for civil and road works are reserved for local contractors like my company.	☐	☐	☐	☐	☐
13h	Government institutions ensure that contracts below K20 million for building construction works are reserved for local contractors like my company.	☐	☐	☐	☐	☐
13i	My company is awarded contracts when it satisfies the criteria relating to Reservation objectives.	☐	☐	☐	☐	☐
	Through Preferential treatment:	**1**	**2**	**3**	**4**	**5**
13j	Government institutions limit the number of contractors who are invited to tender on the basis of Preferential treatment.	☐	☐	☐	☐	☐
13k	Government institutions adjust my bid price in order to facilitate the Preferential evaluation of a bid.	☐	☐	☐	☐	☐
13l	The selection of tenders through Preferential procurement is fair.	☐	☐	☐	☐	☐
	National Council for Construction training programme	**1**	**2**	**3**	**4**	**5**

13 m	The training has equipped my company with skills in road construction operations.	☐	☐	☐	☐	☐
13n	The training has equipped my company with construction project management skills.	☐	☐	☐	☐	☐
13o	The training has equipped my company with the skills to undertake estimation and tendering.	☐	☐	☐	☐	☐
13p	The training has enhanced my chances of tendering for 20per cent subcontracting and/or reserved contracts.	☐	☐	☐	☐	☐
	RDA/NRFA construction financing initiative	**1**	**2**	**3**	**4**	**5**
13q	Construction financing initiative has given my company access to construction equipment.	☐	☐	☐	☐	☐
13r	Construction financing initiative has given my company capital for new investments in my company.	☐	☐	☐	☐	☐
13s	Construction financing initiative has given my company financial support for operations.	☐	☐	☐	☐	☐

Section D: Knowledge transfer in institutionalised supplier development

14. Please indicate the extent to which you agree with the following statements (where 1= Strongly Disagree (SD) 2= Disagree (D) 3= Neutral (N) 4= Agree (A) and 5= strongly agree (SA)).

	Thanks to participating in Government initiatives in the last three years:	**1**	**2**	**3**	**4**	**5**
14 a	My company has acquired important knowledge in road construction.	☐	☐	☐	☐	☐
14b	My company has acquired important knowledge in project management.	☐	☐	☐	☐	☐
14c	My company has acquired important knowledge in road maintenance.	☐	☐	☐	☐	☐
14d	My company has acquired important knowledge in supervision skills.	☐	☐	☐	☐	☐
14e	My company has acquired important knowledge in designing structures.	☐	☐	☐	☐	☐
14f	My company has acquired important knowledge in occupational health and safety.	☐	☐	☐	☐	☐

Section E: Institutional support factors

15. Please indicate the extent to which you agree with the following statements (where 1= Strongly Disagree (SD) 2= Disagree (D) 3= Neutral (N) 4= Agree (A) and 5= strongly agree (SA)).

	Regulatory compliance	**1**	**2**	**3**	**4**	**5**
15a	The regulatory system protects our interests as local contractors.	☐	☐	☐	☐	☐
15b	The regulatory system prevents us from being exploited by main contractors.	☐	☐	☐	☐	☐
15c	The regulatory system ensures that we are paid on time when we deliver.	☐	☐	☐	☐	☐
15d	The regulatory system ensures that we make a profit from our business.	☐	☐	☐	☐	☐
15e	The regulatory system protects us from unfair competition from foreigners.	☐	☐	☐	☐	☐
	Government support: In the past 3 years, the government and its institutions:	**1**	**2**	**3**	**4**	**5**
15f	Implemented initiatives such as the 20per cent subcontracting which benefit my company.	☐	☐	☐	☐	☐
15g	Provided the needed information to my company to participate in government initiatives such as Preferential and Reservation schemes.	☐	☐	☐	☐	☐
15h	Provided financial support to my company from the Construction Finance Initiative.	☐	☐	☐	☐	☐
15i	Provided training through NCC to equip my company with relevant skills.	☐	☐	☐	☐	☐

Section F: Absorptive capacity

16. Please indicate the extent to which you agree with the following statements (where 1= Strongly Disagree (SD) 2= Disagree (D) 3= Neutral (N) 4= Agree (A) and 5= strongly agree (SA)).

	Knowledge acquisition	**1**	**2**	**3**	**4**	**5**
16a	The search for relevant information concerning our industry is an every-day activity in my company.	☐	☐	☐	☐	☐
16b	My company motivates its employees to use information sources within our industry.	☐	☐	☐	☐	☐
16c	My company expects employees to deal with information beyond our industry.	☐	☐	☐	☐	☐
	Knowledge assimilation	**1**	**2**	**3**	**4**	**5**

16d	In my company, supervisors and subordinates frequently share information on construction techniques.	☐	☐	☐	☐	☐
16e	New ideas from the main constructors are often communicated between internal departments/units in my company.	☐	☐	☐	☐	☐
16f	Employees in my company share ideas freely with each other.	☐	☐	☐	☐	☐
	Knowledge transformation	**1**	**2**	**3**	**4**	**5**
16g	Our employees have the ability to structure and use collected knowledge.	☐	☐	☐	☐	☐
16h	Our employees have the ability to absorb new knowledge as well as to prepare it for further purposes.	☐	☐	☐	☐	☐
16i	Our employees successfully link existing knowledge with new insights.	☐	☐	☐	☐	☐
16j	Our employees are able to apply new knowledge in their construction work.	☐	☐	☐	☐	☐
16k	Employees in my company are willing to accept changes that come as a result of the lessons learnt in a particular construction project	☐	☐	☐	☐	☐
16l	My company is able to take advantage of new knowledge and apply it to other construction projects.	☐	☐	☐	☐	☐
16m	My company is able to apply knowledge to cope with changing competitive conditions in the construction industry.	☐	☐	☐	☐	☐
	Knowledge exploitation/application	**1**	**2**	**3**	**4**	**5**
16n	The main contractor and my company make joint decisions on the project.	☐	☐	☐	☐	☐
16o	We share changes in project requirements with the main contractor based on the preferences of our client.	☐	☐	☐	☐	☐
16p	My company is using knowledge from the main contractor or reserved projects to solve new construction problems.	☐	☐	☐	☐	☐
16q	The main contractor’s and my company’s employees interact frequently.	☐	☐	☐	☐	☐

Section G: Contractor operational performance

17. Please rate your improvement in operational performance after participation in Government initiatives (1-Significant deterioration, 2-Minor deterioration 3-No improvement, 4-Average improvement, 5-Significant improvement)

	Thanks to participating in Government initiatives in the last three years:	**1**	**2**	**3**	**4**	**5**
17a	My company is able to deliver projects to quality standards.	☐	☐	☐	☐	☐
17b	My company is able to meet project technical objectives.	☐	☐	☐	☐	☐
17c	My company is able to meet schedule targets.	☐	☐	☐	☐	☐
17d	My company is able to meet budgeted cost targets.	☐	☐	☐	☐	☐
17e	My company has improved its project costing compared to three years ago.	☐	☐	☐	☐	☐
17f	My company is able to comply with health and safety standards.	☐	☐	☐	☐	☐

18. Should you wish to receive a summarised version of the findings, please contact me through the above email addresses.

Thank you for your participation.

Appendix VIII: Interview guide-expert interviews

UNIVERSITY OF KWAZULU-NATAL

Interview guide-expert interviews

Greetings,

My name is Shem Sikombe; I am a PhD student at the University of KwaZulu-Natal, Westville Campus in South Africa and a Lecturer at the Copperbelt University, School of Business, P.o. Box 21692, Kitwe, Mobile: +260972178094/+260953360700 Email: 217080939@stu.ukzn.ac.za or shem.sikombe@cbu.ac.zm

You are being invited to consider participating in a research project entitled: **Knowledge transfer in institutionalised supplier development and organisational performance: evidence from the construction industry in Zambia.** The purpose of this research is to investigate how Government initiatives such as Preferential and Reservation schemes, training by the NCC, the 20 per cent mandatory sub-contracting policy and Construction Finance Initiative have contributed to contractor performance. We hope that the study will provide the much-needed clarity on the effectiveness of these initiatives and offer policymakers an opportunity to reflect upon existing support to local contractors and how future support can be aligned with local contractors' needs.

The study involves no known risks and/or discomforts beyond those encountered in everyday life. The duration of your participation, if you agree to participate and remain in the study, is expected to be 20 minutes.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number **HSSREC/00000717/2019**). In the event of any problems or concerns/questions, you may contact the researcher using the addresses above or the UKZN Humanities & Social Sciences Research Ethics Committee, on the following contact details:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001
Durban 4000 KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary, and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequences. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance, and your responses will not be used for any purposes outside of this study.

All data, both electronic and hard copy, will be securely stored during the study and archived for five (5) years. After this time, all data will be destroyed. If you have any questions or concerns about participating in the study, please contact my research supervisor at the numbers listed above or me.

Sincerely

Shem Sikombe

1. How would you assess the current state of ISD initiatives on small local contractor development? From your experience, have they been working in building the capacity for our local contractors?
2. What are the criteria that you to engage these contractors in participating in these initiatives, is it any Zambian, or NCC registered companies or there is some sought of screening?
3. What regulations/policies/laws are governing the implementation of ISD initiatives?
4. How adequate are the regulations and policies in ensuring the effective implementation of ISD initiatives?
5. Have the ISD initiatives helped the government to achieve its empowerment and development objectives?
6. Which institution/s provide oversight on the implementation of ISD initiatives, especially those related to small local contractors?
7. How effective is information dissemination on such ISD initiatives to small local contractors?
8. Are there specific institutions tasked with monitoring how ISD initiatives are implemented with respect to their objectives?
9. What mechanisms are in place for monitoring the implementation of ISD initiatives with regards to its objectives?
10. How effective is the coordination between Government departments in the implementation of ISD?
11. Do corruption and unfair competition affect the implementation of ISD? If so, how?
12. How would you rate the compliance levels in the implementation of ISD initiatives? Are there any punitive measures when the main contractor fails to comply?
13. How effective is the legal framework with regard to non-compliance to ISD initiatives?
14. Is the regulatory system in which ISD is implemented robust enough to protect the interest of small contracts? Kindly elaborate.
15. What institutional challenges are you facing in implementing ISD initiatives? E.g. funding, budgetary constraints, political interference, fronting, others

Thank you for your participation.