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Luke, Rose, Heyns, G. J., Savage, Christopher J. and Fransman, Logan

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INVESTIGATING LOGISTICS SKILLS GAPS AND THEIR IMPACT ON THE SUPPLY CHAIN: A REVIEW OF THE SOUTHERN AFRICAN SITUATION

R Luke (corresponding author)

University of Johannesburg
Cnr University and Kingsway Roads, Auckland Park
Johannesburg, South Africa, 2092
E-mail:rluke@uj.ac.za
Tel: +27 11 559 4951

G J Heyns

University of Johannesburg

C J Savage

University of Huddersfield

L Fransman

Namibia University of Science and Technology

INTRODUCTION

The research underpinning this paper concerns South Africa (SA) and Namibia. Both countries are members of the Southern African Development Community (SADC), an inter-governmental organisation which aims to further socio-economic cooperation and integration among 15 southern African states, of which SA is by far the larger and dominates the economy and therefore the logistics of the region. SA is the second largest economy in Africa, with the gross domestic product (GDP)(purchasing power parity) for 2014 being approximately US\$707bn, ranking it 30th in the world (Central Intelligence Agency, 2016). In contrast, Namibia's GDP in 2014 was US\$12bn. SA's total foreign trade by value (combined imports and exports) for 2014 was approximately US\$ 127bn, which represents trade with over 220 countries (South African Revenue Services, 2016). Over recent years most of SA's major trading partners have sustained or increased trade with SA. This trend is expected to continue as the economic growth for SA for 2016 and 2017 is 0.7% and 1.8% respectively (International Monetary Fund, 2016). Some of the better performing countries in the region, i.e. Namibia and Botswana, as with most of the countries in the Southern African Development Community (SADC), are heavily reliant on SA, with 66% and 75% respectively of their goods imported from SA (Trading Economics, 2016) and there are therefore many synergies between their economies.

SADC synergies and challenges are influenced by SA, that is seen as the gateway to the region. According to the IMF, the real GDP growth estimate for SADC in 2016 is 3.1% (International Monetary Fund, 2015). Over the period 2003 – 2013 the region's economies grew by an average of 4.7% annually (South African Institute of International Affairs, 2015). This growth has seen other countries in the region have similar gateway aspirations i.e. Namibia, Mozambique and Tanzania (Werikhe & Jin, 2015).

The SADC region has massive potential, as is evidenced by its economic growth rates over the past ten years. SAIIA (2015) asserts that, although the average annual growth rate of 4.7% seems impressive, especially when compared to the equivalent of 2% in the European Union, it lags far behind areas such as ASEAN, with its 7.4% equivalent, implying that there is a clear potential for increased growth. "SADC region has an immense growth potential associated to natural resources availability. Investment opportunities arise in mining, agriculture, manufacturing, financial services, ICT, tourism and infrastructural development. Yet, the region performance continued to fall short of its potential" (Banco Nacional de Angola, 2012).

Oscar (2001) stated that international trade and economic growth were two undividable branches of economics. However for a country to succeed in external markets, it must

have a well-organized and effective logistics industry that provides high standards of customer service (Hoekman, 2014). Another of the key issues underlying the relative lack of development of the SADC potential is the limited intra-regional trade, which accounts for between 10% and 12% of Africa's total trade. This appears very low when compared to approximately 40% in North America, 60% in Western Europe (Tafirenyika, 2014), 52% in Asia and 27% in Latin America (The Economist, 2013).

There are many reasons for SADC not reaching its full potential, including several obstacles to trade e.g. delays, complex documentation requirements, skills shortages and unpredictable border procedures, which all contribute to high costs and relatively low levels of trade in the region (Heyns & Luke, 2012). Hasse (2013) states that "Africa's economic development and ability to compete internationally depend on removing these roadblocks."

One of the most critical "roadblocks" is relative lack of appropriate levels of logistics competence in the region. In the World Bank's Logistics Performance Index for 2014, South Africa ranks as 34rd in the world, down from a high of 23rd in 2012. Comparing this to South Africa's major trading partners (China, Germany, U.S.A., Japan, India, Saudi Arabia and the United Kingdom), indicates some similarities with China, ranked at 28th, however there are few logistics synergies between South Africa and most of its major trading partners. Although Saudi Arabia is ranked 49th and India is 54th, in general, most of the trading partners are ranked considerably higher, i.e. with Germany 1st, U.S.A. 9th, Japan 10th and the United Kingdom 4th (The World Bank, 2015), indicating a mismatch between logistics competencies and a likely inability to trade on equal terms. The LPI confirms SA as dominating in SADC, however logistics improvements have been noted amongst other SADC countries. Namibia moved from 153rd to 93rd between 2010 and 2014, and Botswana from 135th to 120th. Some countries' performance has weakened with Mauritius down from 82nd to 115th and Mozambique ranked the lowest at 147th, down from 115th. There is still a big disparity between SA and the rest of the region on most index evaluating factors, however logistics competence and capabilities remains a problem for all. Trade within the region is thus severely hampered by logistics skills shortages.

The Global Competitiveness Report (World Economic Forum, 2015) indicates further skills issues, with SADC countries ranging from a ranking of 50 (Seychelles) through 116 (Namibia) to 120 (South Africa) and 130 (Mauritius) when tested on the quality of the higher education system (which measures how well the education system meets the needs of a competitive economy). The region's major trading partners' rankings range from 15 (United Kingdom) to 67 (India), again indicating a mismatch in skills levels.

The above rankings, in terms of the Logistics Performance Index, as well as the Global Competitiveness Report, clearly indicate that skills are an issue within the region. The World Economic Forum's Outlook on the Logistics & Supply Chain Industry 2012 report indicates that skills shortages are key risks within the industry (WEF, 2012). As the world wide skills shortage becomes more severe, many countries experience difficulties in retaining their available talent. Many countries, including the United Kingdom and Australia, recognise their skills scarcities and have adjusted immigration plans to attract people with the appropriate skills sets (Migration expert, 2012). For developing countries it therefore becomes increasingly difficult to retain their existing talent.

Logistics skills in particular are hampering the ability to trade both within the region as well as with other countries and regions. "Africa's share of world trade is tiny—only 3% in 2009, according to the United Nations Conference on Trade and Development." (Hasse, 2013). It thus becomes critical to identify the logistics skills requirements in southern Africa, so that shortages can be addressed to the benefit of trade in and with the region.

RESEARCH METHODOLOGY

The purpose of this article is to obtain a better understanding of the current logistics skills shortages in southern Africa and to provide an indication of the skills required to develop effective supply chains in the region. Based on earlier research by Heyns and Luke (2012, 2014), which focussed on the supply chain skills requirements in the South African economy, a comparative research methodology was followed to ascertain the logistics and supply chain related skills requirements in Namibia. An initial exploratory study was conducted in Namibia to investigate if any synergies exist between the two neighbouring countries. Literature (Kisperska-Moron, 2010) suggests that a general shortage of educated and skilled supply chain managers exists worldwide and this research attempts to explore the critical skills required to enhance the competitiveness of supply chains in southern Africa.

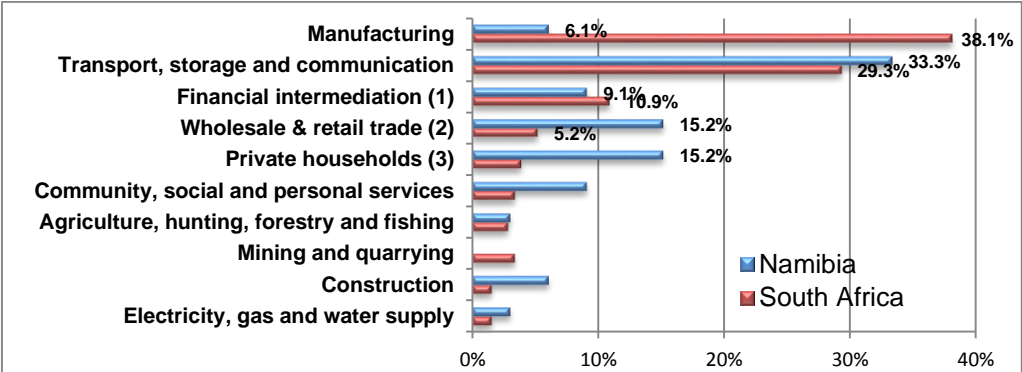
Based on a review of various international studies (Heyns & Luke, 2012), a preliminary list of 66 skills areas were identified as important to logistics and supply chain managers. A panel of academics and industry experts in these fields deliberated the initial list and subsequently reduced it to a set of 38 which they perceive to be critical to industry. This panel further grouped these as follows: (1) general management, (2) behavioural/interpersonal skills, (3) logistics awareness, (4) logistics analytical, (5) logistics information technology, and (6) environmental awareness.

To acquire a better understanding of the existing logistics skills requirements in South Africa, data from surveys conducted at two Annual SAPICS conferences (Association for Operations Management in Southern Africa), in 2011 and 2012 was used. The methodology used was convenience sampling. In both surveys the respondents were asked to rate, on a scale of 1 (to no extent) to 4 (to a large extent), the importance of the various skills and skills groups in the recruitment process for logistics and supply chain employees in South Africa. The analysis of the skill requirements are based on the survey results of 204 and 200 respondents in 2011 and 2012 respectively.

To acquire an initial understanding of the existing logistics skills requirements in Namibia, an exploratory survey was conducted at the 7th Annual Logistics and Transport Workshop at the Namibian University of Science and Technology (NUST) in 2015. The survey required respondents to rate the level of importance of the various skills and skills in Namibia. The analysis of the skill requirements are based on the survey results of 33 respondents. Although the number of respondents could be viewed as a limitation of the study, the researchers are of the opinion that the specialised nature of the sampling pool was capable of eliciting a relatively representative view of the opinions of Namibian practitioners. A further limitation could be regarded as the differing timescales of the surveys, however the Namibian survey was intended to be exploratory, with the aim of extending the research into the SADC region into the future.

RESEARCH RESULTS

Both surveys covered various industrial sectors and the profiles are depicted in Figure 1.



(1) Financial intermediation, insurance, real estate and business services
 (2) Wholesale & retail trade; motor vehicles/cycle repair, personal & household goods; hotels & restaurants
 (3) Private households, extritorial organisations, representatives of foreign governments and other activities not adequately defined

Figure 1: Industries represented by respondents

The surveys used a four-point Likert-type scale. In terms of mean importance, respondents from South Africa ranked the skills group 'Logistics Awareness', as the most important, followed by 'General Management' and 'Logistics Analytical'. Respondents from Namibia ranked the skills group 'General Management', as the most important, followed by 'Logistics Analytical' and 'Behavioural / Interpersonal skills'. The low rating of logistics awareness is evident from Savage, et al. (2013) who illustrate the lack of understanding of logistics found within the Namibian industry. Both respondent groups rated 'Logistics IT' and 'Environmental awareness' the least important skills groups.

Table 1: Mean rating of proposed skills group

Skills Group	South Africa		Namibia	
	Mean	Rank	Mean	Rank
Logistics Awareness (e.g. see "big picture", total cost concept)	3.58	1	3.54	4
General Management (e.g. plan, organise, control)	3.52	2	3.72	1
Logistics Analytical (e.g. demand forecasting, transport & warehouse management, quantitative analysis)	3.46	3	3.62	2
Behavioural / Interpersonal skills (e.g. time & diversity management, people & social skills)	3.46	4	3.62	3
Logistics IT (e.g. software knowledge, computer skills)	3.17	5	3.48	5
Environmental awareness (e.g. reverse and "green" logistics)	3.00	6	3.38	6

The South African respondents were requested to indicate their agreement with a list of 38 (2011) and 30 (2012) skills regarded as important when recruiting employees. The ranking of the skills in terms of the perceived importance was established by calculating the mean of the various skills items. Table 2 depicts the descriptive statistical results of these results.

For the South African practitioners the most important logistics and supply chain-related skills are 'Customer focus' followed closely by 'Ability to plan and prioritise' and 'Business ethics'. The ten highest ranked skills comprise mostly 'softer' (i.e. Business/Interpersonal = 5) and very broad management skills (i.e. General Management = 3). 'Customer focus' and the 'Ability to see the big picture' are the two most important logistics awareness (LA) skills that are viewed as essential by the respondents.

Table 2: Mean rating of required skills of logistics managers (South Africa)

RANK	SKILLS ITEM	SKILLS GROUP	MEAN	RANK	SKILLS ITEM	SKILLS GROUP	MEAN
1	Customer focus	Logistics Awareness	3.64	20	Spreadsheet abilities	Logistics IT	3.23
2	Ability to plan and prioritise	General Management	3.62	21	Motivation skills	Behavioural / Interpersonal	3.22
3	Business ethics	Behavioural / Interpersonal	3.62	22	Negotiating skill	Behavioural / Interpersonal	3.21
4	Ability to see big picture	Logistics Awareness	3.57	23	Quality management	Logistics Awareness	3.19
5	Team work	Behavioural / Interpersonal	3.56	24	Transport and related regulation knowledge (1)	Logistics Awareness	3.17
6	Problem solving	Behavioural / Interpersonal	3.55	25	Supply chain design	Logistics Analytical	3.17
7	Ability to think outside the box	Behavioural / Interpersonal	3.51	26	Transport management	Logistics Analytical	3.15
8	Communication skills	Behavioural / Interpersonal	3.48	27	Procurement / Purchasing management	Logistics Analytical	3.13
9	Business process improvement	General Management	3.47	28	Project management (3)	General Management	3.13
10	Decision making	General Management	3.47	29	Networking skill (3)	Behavioural / Interpersonal	3.13
11	Time management (3)	Behavioural / Interpersonal	3.38	30	Quantitative and/or statistical skills	Logistics Analytical	3.09
12	Inventory management	Logistics Analytical	3.34	31	Conflict management (3)	Behavioural / Interpersonal	3.07
13	Leadership	General Management	3.33	32	IT skills / software knowledge	Logistics IT	3.01
14	Cross-functional coordination skills	Behavioural / Interpersonal	3.31	33	Reverse logistics	Logistics Awareness	3.00
15	Change management	Behavioural / Interpersonal	3.29	34	Order processing (3)	Logistics Analytical	2.93
16	Warehousing / Materials Handling manage	Logistics Analytical	3.28	35	Knowledge of environmental issues	Environmental Awareness	2.86
17	Supply chain cost knowledge	Logistics Analytical	3.28	36	Facility location / Network design (3)	Logistics Analytical	2.81
18	Knowledge of the industry	Logistics Awareness	3.24	37	Data mining (3)	Logistics IT	2.79
19	Demand forecasting	Logistics Analytical	3.23	38	ISO 14000 standards (2)	Environmental Awareness	2.71

(1) "Laws and regulation" in 2012 survey

(2) "Green logistics/ environmental issues" in 2012 survey

(3) Only in 2011 survey

The Namibian respondents were requested to indicate their agreement with a list of 38. Table 3 depicts the descriptive statistical results of these results. The most important logistics and supply chain-related skills are 'Team work' followed by 'Business ethics' and 'Customer Focus'. The ten highest ranked skills, similar to the South African results, also

comprise mostly 'softer' (i.e. Business/Interpersonal = 6) and broad management skills (i.e. General Management = 3). 'Customer focus', an important logistics awareness (LA) skill, also features relatively highly.

Table 3: Mean rating of required skills of logistics managers (Namibia)

RANK	SKILLS ITEM	SKILLS GROUP	MEAN	RANK	SKILLS ITEM	SKILLS GROUP	MEAN
1	Team work	Behavioural / Interpersonal	3.84	20	Project management	General Management	3.40
2	Business ethics	Behavioural / Interpersonal	3.72	21	Supply chain design	Logistics Analytical	3.40
3	Customer focus	Logistics Awareness	3.72	22	Warehousing / Materials Handling management	Logistics Analytical	3.40
4	Time management	Behavioural / Interpersonal	3.71	23	Networking skills	Behavioural / Interpersonal	3.39
5	Ability to think outside the box	Behavioural / Interpersonal	3.68	24	Conflict Management	Behavioural / Interpersonal	3.36
6	Problem solving	Behavioural / Interpersonal	3.68	25	Motivation skills	Behavioural / Interpersonal	3.36
7	Communication skills - written and oral	Behavioural / Interpersonal	3.67	26	Quality management	Logistics Awareness	3.36
8	Ability to plan and prioritise	General Management	3.64	27	Cross-functional coordination skills	Behavioural / Interpersonal	3.32
9	Demand forecasting	Logistics Analytical	3.61	28	Reverse logistics	Logistics Awareness	3.32
10	Transport & related regulation knowledge	Logistics Awareness	3.60	29	Change management	Behavioural / Interpersonal	3.29
11	Ability to see big picture	Logistics Awareness	3.56	30	Order processing	Logistics Analytical	3.28
12	Decision making	Logistics IT	3.56	31	Facility location / Network design	Logistics Analytical	3.24
13	Negotiations skills	Behavioural / Interpersonal	3.52	32	Procurement / Purchasing management	Logistics Analytical	3.24
14	Business process improvement	General Management	3.50	33	Quantitative and/or statistical skills	Logistics Analytical	3.21
15	Transport management	Logistics Analytical	3.48	34	Spreadsheet abilities	Logistics IT	3.21
16	Inventory Management	Logistics Analytical	3.44	35	Data mining	Logistics IT	3.20
17	Knowledge of industry	Environmental Awareness	3.44	36	Knowledge of environmental issues	Environmental Awareness	3.17
18	Supply chain cost knowledge	Logistics Analytical	3.42	37	ISO 14000 standards	Environmental Awareness	3.00
19	Leadership	General Management	3.40	38	IT skills / software knowledge	Logistics IT	3.00

When comparing the top ranked skills from the South Africa and Namibia surveys, it is noticeable that, albeit in a different order, seven skills are present in both top ten (when comparing the top 20, 16 skills are present in both). Most are soft skills. Similarities are also noticeable between the least important skills, as seven skills are found on both lists. For the Namibian practitioners the majority of the ten least important skills are related to logistics analytical skills followed by environmental awareness and logistics information technology related skills.

The majority of South African practitioners (63%) suggested that it was relatively easy to fill operational level positions. Similarly only 33% of the Namibian practitioners indicated that they have difficulties in filling operational level positions. It seems that tactical level positions are slightly easier to fill in Namibia with only 52% of respondents indicated difficulties in filling tactical level positions, as opposed to 65% of South African practitioners. A significant difference is evident when it comes to filling strategic level positions. It appears that South African practitioners find it much more challenging to fill these positions with 65% indicating difficulties, compared to only 40% of Namibian practitioners. Figure 2 shows that industry is struggling to attract people with the right skills and qualifications, particularly at tactical and strategic levels.

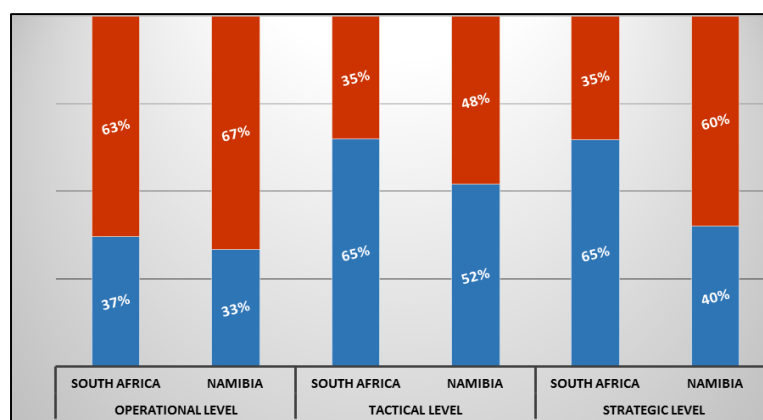


Figure 2: Difficulty of filling positions at various employment levels

Respondents were also requested to indicate which job functions are the most difficult to fill with suitable employees for operational, tactical and strategic level positions. Tables 4

and 5 provide lists of the ten most challenging job functions to fill for each of the management levels as indicated by South African and Namibian practitioners respectively.

Table 4: Positions most difficult to fill (South Africa)

Rank	Operational level	Tactical level	Strategic level
1	Managers (incl. distribution, ops, logistics, commercial)	Managers (incl. inventory, logistics, ops, project, transport, warehouse)	General managers
2	Controllers & supervisors	Planners (incl. transport, supply)	SC Managers
3	Drivers (Truck)	Demand planners	Executive & Directors
4	Planners (Demand)	Business analysts	Planners
5	Clerks	Procurement staff	SC Strategist/consultant
6	IT SC Specialist	Planner (Inv & prod)	Business analyst/researchers
7	Procurement staff	Controllers & supervisors	Logistics managers
8	Stores/Warehouse staff	Supply chain strategist	Procurement managers
9	Logistic staff	Consultants	Operational managers
10	Buyers	SC IT Specialists	Specialist managers

Table 5: Positions most difficult to fill (Namibia)

Rank	Operational level	Tactical level	Strategic level
1	Drivers	Inventory Managers	Supply Chain Managers
2	Cerks	Transport Managers	General Managers
3	Transport Planners	Logistics Planners	Researchers
4	Organizational Leaders	Organizational Leader	Fleet Managers
5	Operations researchers	Logistics Officers	Procurement Managers
6	Logistics Managers	Asset Manager	IT Managers
7	Inventory Controllers	Contract Manager	Logistics Planners
8	Warehouse supervisors	Demand forecaster	Statisticians
9	Buyers	Quality & Safety supervisors	Operations Managers
10	Mechanics	Project planners	Asset Managers

As the global economy is reliant on effective logistics and supply chain management, it is evident from the above that the development of supply chain skills in southern Africa is critical to the success of its trade with its global partner countries.

CONCLUSION

The findings from this research strongly imply that there are significant logistics skills shortages in the supply chain industries of both South Africa and Namibia. Given the quality of the higher education system, as measured by the Global Competitiveness Report, it is unlikely that skill levels will improve enough, in the near future, to allow the achievement of efficiencies that global supply chains demand. Such skill deficiencies are likely to inhibit the enhancement of the supply chains into value chains. Therefore, it can be seen that the skills gaps are acting as barriers to the development of supply chains and therefore of trade in and with the region.

On a more detailed level there are a number of similarities and differences between South Africa and Namibia that may be significant. For example, the samples from both countries show that at an operational level it is proving to be difficult to fill relatively low-skilled jobs such as clerks and drivers. This indicates that part of the problem, at least, is not simply the need for logistics education, but that training for these jobs seems to be being frustrated by the poor level of general education (e.g. literacy and numeracy), which is prevalent across both countries. At the other end of the skills spectrum, it appears that strategic level positions are harder to fill in South Africa than in Namibia and that these types of jobs are becoming more challenging to fill. Whilst it is clear that demand is outstripping supply, there are a number of possible reasons behind this. Firstly, it could simply be a worsening ability of the logistics education system to replace managers that have retired or moved on. Alternatively, the difficulty may be a function of increasing need for strategic supply chain thinking rather than a decline in the number of

skilled personnel. This, in turn, reflects the growth in the industry and its maturity. This interpretation would also explain the perceived difference between South Africa and Namibia as the Namibian industry is less mature and does not seem to be expanding as rapidly.

Skill shortages are not however unique to Africa rather, currently, there seems to be an issue throughout the supply chain world; e.g. although almost 10% of the working population of the UK is engaged in supply chain activity, the sector has an acute recruitment predicament that extends well beyond lorry drivers (Kelly, 2015). According to Beimel, vice-president at DHL Global Forwarding: "Supply chain managers are retiring faster than they can be replaced. There simply are not enough young people to backfill the pipeline" (Kelly, 2015). Further, Kisperska-Moron (2010) suggests that a different skills set will be required in the future as excellence is required from the beginning of operations as there is no time to improve performance during its [the supply chain's] lifetime, which is believed to be no more than 5–7 years.

The findings also suggest that the levels of skills that both the Namibian and South African logistics industries are able to supply are unlikely to be commensurate with their visions and ambitions of enabling economic and social development through the benefits of membership of the 'global supply chain community'. Analysis has revealed that the problems besetting both countries' industries are similar and, at least to a substantial degree, due to human capital related issues, just as much as more concrete ones such as infrastructure limitations.

Although the data analysed is only from two of SADC's fifteen or Southern African Customs Union (SACU)'s five member states, it is reasonable to postulate that similar issues are likely to prevail across both communities and therefore across southern Africa as a whole. Although this would need confirmation by further research, it suggests that the achievement of effective supply chains is unlikely to be achieved in the near future. Without such competitiveness, companies and their host countries are not able to support the trade necessary to generate the wealth that is needed for development, particularly in emerging economies.

This research has enabled conclusions to be drawn, but inevitably there are a number of limitations that should be addressed by future research both to validate and enhance the conclusions. Notably, the research sample in the Namibian survey could be expanded in the future and the research could be replicated in other SADC/SACU countries. It is also intended that the South African survey be updated in 2016. A further avenue for research is the investigation of current competency levels of key supply chain skills.

Notwithstanding the potential further work, the research to date makes it clear that, if South Africa and Namibia want to achieve their potential within the global market, they must offer supply chains that are appropriate for the task. To do so, it is vital to address the skills shortage issues to overcome the barriers that have been identified. These skills shortages occur at all levels from the driver or warehouseman to managers, directors and government officials. Although this cannot guarantee immediate success, as improving human capital is inevitably a slow process, suitable programmes must be treated as a high priority. Such education must address cultural issues and human resource based skills as well as the more obvious functionally related ones. It is therefore recommended that the governments of Namibia and South Africa allocate resources to fully identify the logistics educational needs and address them as a matter of urgency.

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