

State-led Maritime Governance, Education and Training Nexus in South Africa

Syanda Alpheous Mthuli¹ and Nikita Singh²

¹Discipline of Public Governance, School of Management, Information Technology & Governance, University of KwaZulu-Natal, Durban, South Africa

²Graduate School of Business and Leadership, University of KwaZulu-Natal, Durban, South Africa

MthuliS@ukzn.ac.za

SinghN1@ukzn.ac.za/SinghN2107@gmail.com

Abstract: The maritime environment has a significant socio-economic impact on nations, regional and global economies. However, it also experiences many challenges related to safety, security, Education and Training (E & T) which stakeholders such as businesses and government through State institutions play a crucial role in addressing. In addition to high global labour demands, E & T challenges have related to the decreasing number of youth taking up maritime E & T. In addition, technological advancements affect costs, standards, and quality of maritime ET. The Republic of South Africa (RSA) has not been immune to these challenges. Public higher E & T institutions in RSA are the primary providers of tertiary maritime E & T but remain confronted by numerous challenges tied to organisational resources, State funding and the growing demand for increased internal and external capacity. This study's objective was to examine maritime State-led interventions and challenges in selected public higher E & T institutions offering maritime studies in the coastal province of KwaZulu-Natal (KZN), RSA. Guided by a Systems Thinking approach, this empirical study adopted a qualitative research methodology utilizing interviews with key knowledge holders and secondary data. It was found that there exists a consensual view that higher E & T institutions offering maritime studies in the province are well positioned to play a more meaningful role in addressing the country's high unemployment rate. However, the current conditions in maritime E & T have undermined this and resulted in the pursuit of international partnerships to address local deficiencies. These findings are significant to stakeholders involved in maritime higher E & T, State-led maritime interventions, policymaking, governance, management, leadership and administration. The findings of the study also point to the need for a holistic understanding of maritime issues and challenges as maritime E & T is a complex global social space. This could eventually facilitate innovation, enhance leadership and contribute to meaningful and crucial partnerships between developed and more developing nations.

Keywords: Maritime Education & Training, Partnerships, Technological Advancements, South Africa, Systems Thinking, Causal Loop Diagram

1. Introduction

The Republic of South Africa (RSA) is home to the African continent's most developed maritime industry and infrastructure. However, the country experiences numerous socio-economic challenges, including high levels of unemployment, poverty, and inequality (collectively referred to as the Triple Challenge). This is compounded by limited access to higher education, especially amongst the youth (Mthuli, Singh & Reddy 2023; Girardi, Rubbo, Broday, Arnold & Picinin, 2024). The maritime sector is seen as having the potential to bridge the employment gap (SAMSA, 2017; Mthuli & Biyela 2019). Post-Apartheid, the country's democratization led to the development of grand policies in RSA such as the current National Development Plan (NDP) which presented the State's vision for 2030. The NDP states that: "Education, training and innovation are central to South Africa's long-term development, and higher education is the major... linked to economic development. However, education is much more than a simple instrument of economic development" (NDP, 2012: 261-262). Public higher education institutions in RSA are Constitutionally mandated to contribute to the strengthening of industries in the country (Mthuli, 2018) by providing programmes in various fields and disciplines, including Maritime Education and Training (MET). However, in RSA, MET is limited to a handful of secondary schools and higher education institutions (HEIs). Furthermore, awareness and opportunities thereof amongst the youth is limited (Mthuli 2018; Mthuli, Nzimakwe, Biyela & Khambule 2018; Worm, et al., 2021).

2. The Maritime Industry and Maritime Education and Training in RSA

RSA's location at the southern-most tip of Africa favours the country as it offers access to other African countries and to the Southern Hemisphere and Europe during turbulent times, spilling onto the Bab-el-Mandeb strait between Yemen on the Arabian Peninsula and Djibouti in the Horn of Africa - a maritime chokepoint influencing access to the Suez Canal in Egypt (Mthethwa, 2003; Mthuli & Biyela, 2019; Lott, 2021). The country has eight commercial ports (Meyiwa & Chasomeris, 2020) and every year, three hundred million tons of cargo move through the country's ports in both imports and exports. Furthermore, 1.2 million tons of liquid fuels such as

crude oil, gas and petrol move along the country's coast, making it well situated to take advantage of maritime opportunities in the region, such as East-West cargo traffic and the booming African offshore oil and gas industry (RSA Department of Environmental Affairs, 2017). Thus, RSA "is a maritime nation" (Sink, et al., 2021: 4). RSA is one of the leading African countries in terms of maritime transport; hence the need for trade implies the need for skills (SAMSA, 2011; Mthuli et al. 2018; Mthuli & Biyela 2019).

MET in RSA has a long and complex history. Changing politics and the associated shifting priorities significantly influenced the direction MET has taken since its establishment in 1922 (SOMMSA, 2016). Post 1994, the government's approach to the maritime sector in the country is geared towards racial transformation and equity (Ruggunan, 2008; Ruggunan, 2010; Mthuli et al. 2018). Bonnin and Woods (2002) noted that post 1994, "training and development in the South African shipping industry had to take on not only the exigencies of global competition and new certification regimes, but also the pressing need to promote equity and above all, to facilitate the upward mobility of black seafarers" (Bonnin and Woods, 2002: 5). It is generally acknowledged that in terms of education, training and standards, MET in RSA's public higher education institutions has an outstanding status. In addition, because it is an English-speaking country, it has been seen as a favourable country regarding maritime assurance in terms of its MET certificates (Bonnin & Woods, 2004). This has resulted in the country having sixty-two accredited training providers offering a range of courses, some of which are Standards of Training Certification and Watchkeeping (STCW)-compliant, whilst others are more industry specific (SOMMSA, 2016).

Maritime studies comprise either maritime education (ME) or maritime training (MT), or a combination, of both in the form of maritime education and training (MET). Such programmes exist in isolated pockets in several large public higher education institutions (universities) in RSA (SAMSA, 2017; Mthuli et al. 2018; Mthuli 2018). Furthermore, there is also no evidence of joint degrees, qualifications or foreign aligned or accredited qualifications being offered in local higher education institutions (SAMSA, 2011). RSA has no single public tertiary institution that provides MET on a scale and level that can promote it as the dominant or primary service provider of the maritime industry and related sectors (Mthuli et al. 2018). Furthermore, many of the institutions have programmes in similar fields, with only limited specialisation (SAMSA, 2011; Mthuli 2018). MET in RSA lacks coordination and focus that could contribute substantially to the benefit of the sector and the individual institutions (SAMSA, 2011). RSA has seven public higher education institutions that provide maritime education (ME) or maritime training (MT). There are also public post-school providers of ME or MT, including Further Education and Training (FET) institutions, and Government and Parastatal Organisations, such as Transnet. However, at tertiary level, RSA has no solely MET-dedicated public higher-education institution and there are many challenges facing the maritime industry and State-led MET in the country.

3. Challenges Facing MET in RSA

There are many hurdles facing tertiary institutions in RSA, with the most noted been the lack of funding or underfunding, and slow transformation post-Apartheid. Habib (2016) estimated that the RSA's tertiary institutions receive merely R22 billion in funding/government subsidies, whereas the Higher Education and Training Department of the country requests on average R37 billion.

Another problem that has long faced MET in the country is that of attracting qualified academic staff (see Bonnin and Woods, 2002) due to the high-scale salaries maritime professionals earn as practitioners; as was the case with MET institutions such as the Durban University of Technology (DUT) and the University of KwaZulu-Natal (UKZN) (Mthuli, 2014) which were forced to recruit internationally. However, this presented its own challenges, such as the slow process of issuing work visas/permits which frustrated prospective MET lecturers resulting in them turning down placements in RSA (Mthuli, 2014). In the case of UKZN, the difficulty in recruiting maritime academics was augmented by salaries that were not competitive according to industry standards, with the University of Cape Town's (UCT's) Maritime Law programme experiencing similar issues (Mthuli, 2014). According to Mthuli (2014): "the weaknesses that exist in Durban's higher education institutions are a stumbling block to the growth of the broader maritime industry to a point that, there is an inability to produce the required human capital in some professional areas..." (Mthuli, 2014:124). In addition, these institutions face many curriculum challenges and struggle to keep up with industry-related technological advancements (Phewa, 2021).

Companies that usually offer sea-time training (training berths) for the country's MET students have overtime decreased the number of available training spaces in their ships, with students therefore being unable to complete their qualifications (Bonnin and Woods, 2002; SAMSA, 2014; Mthuli, 2018). The province of KwaZulu-Natal (KZN) has a thriving maritime culture and industry and is home to the DUT, one of only two public higher-

education institutions in RSA offering seafaring – sea-going MET. The other is Cape Peninsula University of Technology (CPUT) and apart from one other institution in Egypt, they are the only providers of seafaring diplomas on the African Continent. DUT and CPUT were collectively of the view two decades ago that government had to become involved in the issue of the availability of berths in the country because of the magnitude of negotiation involved (see Bonnin & Woods, 2002). It was identified that the government could negotiate bilateral agreements like the one the government of Indonesia had with a worldwide shipping line in training a certain number of Indonesian cadets annually (CPUT, 2002 cited in Bonnin and Woods, 2002).

The shortcomings of the MET system in RSA have presented an opportunity for ‘fly-by-night’ private MET institutions, which are often not accredited (Mthuli, 2014). Furthermore, RSA has limited maritime study options, especially for inland and or disadvantaged communities. As a result, most young people still do not consider professions in its maritime industry, considering the vast economic opportunities it presents, hence the need for greater State-government interventions.

4. The Maritime Industry and the State-government MET Nexus in RSA

Globally, governments through State institutions - govern and develop their MET under unique social-economic circumstances, reacting in different ways to global changes in the shipping and broader maritime industry. These interactions are distinctive, because States are very different socially, economically, and politically, and have undergone unique historical trajectories (Ruggunan, 2010), hence Ruggunan (2008:285) notes that: “...State institutions that service the seafaring industry have had very little impact on the restructuring of the labour market for South Africa’s seafarers, nationally and especially globally”, thus “racial equity transformation of the national seafaring labour market are key goals of the post-apartheid State as opposed to more ambitious and concerted efforts to engage in job creation strategies to export South African mariners into the global market”.

While changes to the maritime industry in terms of labour market demands and certification occur globally, (Ruggunan, 2010; 2016), state institutions are key players in shaping and restructuring labour markets. Ruggunan’s notion supports Standing (1999) and Botlanski and Chiapello’s (2007) arguments that because labour markets are imbued with institutional arrangements, they tend to be more more complex. Today more than ever universities are now seen as key drivers of change, with RSA universities having forged links fostered by State institutions such as the South Africa International Maritime Institute (SAIMI) and the eThekweni Maritime Cluster (eMC). These Institutions are seen as significant in bridging the skills gap in RSA as they bring together industry and MET institutions to foster cooperation and coordination. In this way, they collectively work towards achieving the goals of national strategies and policies such as Operation Phakisa and the National Development Plan (NDP). Operation Phakisa which was launched in 2014, with the starting point been the surrounding vast ocean in the country that had not been fully taken advantage of, and the huge economic potential of this untapped resource (South Africa’s Department of Planning, Monitoring and Evaluation, 2017) as these oceans have the potential to contribute up to 177 billion Rands to the Gross Domestic Product (GDP) and to create just over one million jobs by 2033 (Moorcroft, 2017; South Africa’s Department of Planning, Monitoring and Evaluation, 2017).

5. Methods

The objective of this research was to examine State-led maritime interventions and challenges in select public higher education MET institutions in KZN, RSA. Guided by Systems Thinking, this study adopted a qualitative exploratory design, utilising primary interview data and secondary data from academic journals, books, official government reports, policy documents, newspaper articles and internet sources. Systems Thinking is based on principles pertaining to holism, interconnection, communication, and emergence (Singh, 2021). It moves away from conventional reductionistic approaches by exploring phenomena in a holistic manner by identifying overall system patterns and structures (Hjorth & Bagheri, 2006; Singh, 2021).

An interpretivist philosophical approach was deemed necessary for achieving this study’s objective. All public higher education institutions in KZN, RSA offering MET, as well as all government institutes and departments involved in the coordination and promotion of MET in the country were targeted. A non-probability sampling strategy, applying a purposive – judgmental sampling technique in which only individuals with certain characteristics such as particular strategic positions and knowledge apropos the provision of MET at public higher education institutions, government departments and institutes in KZN, were sampled for interviews (Mthuli, Ruffin & Singh, 2021). The process of thematic analysis was conducted to organise and interpret the data. After the collected data was read, organised, analysed and coded, themes were constructed after which

the Systems Thinking methodology was applied to guide the final analysis of the research. Overall, the study's limitations included the proximity of the researcher to certain maritime institutions, gaining access to these institutions and the lack of recent research on maritime E & T in the South African context.

6. Findings

This study's findings are aligned with its purpose, that of examining maritime State interventions and challenges in selected public higher maritime education and training institutions in RSA's coastal province of KZN. A key theme that emerged was the dynamics related to State-led MET. Understanding government policy positions on the maritime environment and related socio-economic challenges remain at the core of this study's findings, as well as the role of the State and its respective institutions. One participant expressed that:

"The maritime industry is one of the strategic pillars of government, so it is key priority area and remember as a province we have the KwaZulu-Natal Integrated Maritime Strategy which is a road map for the robust development of the provincial maritime industry, which has four main goals for the maritime industry. The first being infrastructure development, the second deals with subsector development, the third being transformation and the fourth looks at skills development and research" (Interviewee: 5).

A participant expressed that for training and skills development to be achieved in the maritime industry in KZN, the first stage in the process is industry promotion. While another participant mentioned that:

"The majority of the population in South Africa, especially the African people, they were deprived of information. As a result, state institutions involved in facilitating maritime skills development and sustainability start at basic education, where they educate the youth, about the different careers and opportunities available within the maritime industry because it's important to make them aware of such at an early stage of their education" (Interviewee: 2).

"We facilitate the working together of both industry experts (both local and international) and MET institutions to work together to identify the skills gaps, needed skills and training, as well as education necessary to bridge the gap" (Interviewee: 2).

The process of working together involves shaping MET curriculum to inform the qualifications that are deemed necessary based on the information these stakeholders provide. The participants expressed that MET facilitation and coordination by state institutions also involves conducting a skills audit of MET lecturers to capacitate them to teach newly developed MET programmes. The need for facilitating and collectively addressing MET issues is further identified by a participant who asserted that:

"MET students are being produced as seafarers. However, you find that there is a limitation because of the availability of berths resulting from South Africa not having ships, so after the students complete their theoretical work and now require practical training to complete their seafaring qualification, where will they get the sea-hours (practical training) they need" (Interviewee: 2).

While another participant indicated that:

"...the technological side of simulations involves financial commitment - which we do not have" (Interviewee: 3).

Participants see the relationship with State institutions as of mutual interest with two participants indicating that:

"...we are part of the same whole" (Interviewee: 7).

"We love working with public higher education institutions that are planning to offer new MET qualifications, because when we work with them, we can assist them shape the qualification in a way that it is informed by the industry needs, so that by the time they produce the first graduate, industry is expecting them" (Interviewee: 2).

However, the State's influence has been very limited with one participant saying:

"They come and ask us for stats" (statistics) and we give them and they ask us what we need, and we tell them. How many more staff you need and how many more simulators and classrooms we

give this information but things are never sent and we never get feedback to say when they are going to give us the things we need” (Interviewee: 1).

It was further identified that there was a disconnect between government policy in facilitating maritime development and sustainability, industry skills demand and MET supply:

“There is a disjuncture, a separation or disconnection between where industry is at in terms of speed, updates, applications and systems and how the university teaches” (Interviewee: 7).

Participants acknowledged that there is a partial disjuncture between MET programmes provided by public higher education institutions in KZN and the needs of the industry, especially regarding rare or scarce maritime skills such as maritime finance, architecture, etc. These findings reveal that MET public higher education institutions feel that much more must be done by the State to promote and assist in the coordination of MET, in the form of for example, resource provision.

7. Discussion

Systems Thinking utilizes Causal Loop Diagrams (CLDs) to make sense of and communicate system-wide dynamics, feedbacks and relationships. CLDs are qualitative tools (Schuster, 2003) and graphical representations of the interconnected and continually interacting elements comprising the ‘system’ (Singh, 2014; Singh & Mthuli, 2021). The CLD in Figure 1 was constructed based on interview and secondary data to reveal the interconnected dynamics related to State-led MET in RSA. Key variables in the diagram are in bold in the ensuing discussion. The plus signs (+) indicate variables that influence each other in the same manner, whilst minuses (-) indicate variables that have an inverse relationship to one another.

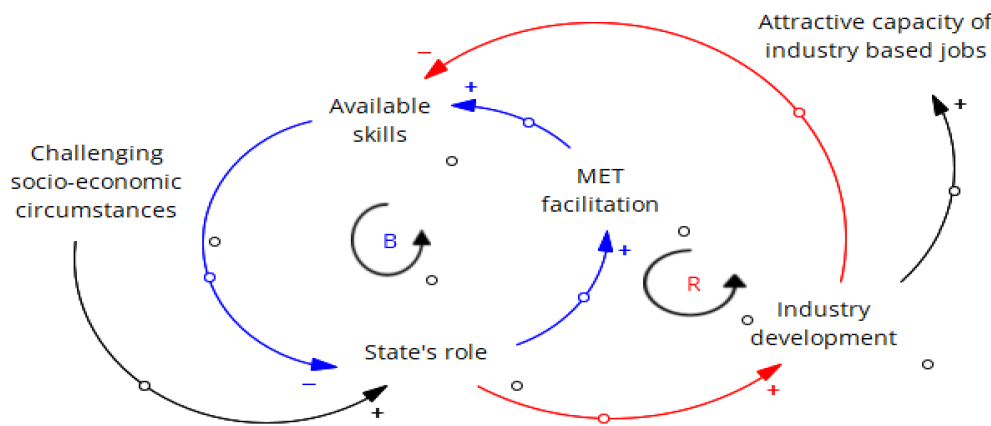


Figure 1: Causal Loop Diagram of the dynamics of state-led MET in RSA (Source: Authors' own)

The Systems Thinking based CLD suggests that **Challenging Socio-economic Circumstances** increase the **State's Role** in the maritime industry, which in turn encourages **Industry Development**. This is not unique to RSA as the maritime governance of many European nations has been re-oriented towards 'blue growth' (Guerriero, 2021). In Canada and Indonesia (Chen, 2000; Bonnin and Woods, 2002) where the government prioritises MET to deal with chronic unemployment, training in fisheries, navigation, oil, and gas operations have been prioritised, which has improved MET in these countries. Maritime **Industry Development** increases the **Attractive Capacity of Industry Based Jobs**. However, it decreases **Available Skills**, because as skilled people become employed, the remaining stock of skilled people available to be employed dwindles. Thus, the industry absorbs skilled people at a faster rate than MET institutions can supply them. The State must then intervene once again. Thus, a decrease in **Available Skills** increases the **State's Role** in the maritime industry, which in turn increases its **MET Facilitation** at public higher education institutions. Once again, this increases **Available Skills** while the **State's Role** in the maritime industry then decreases as they see statistics improving. These dynamics create a Balancing feedback loop (B) and a Reinforcing feedback Loop (R) which constantly balance each other out. Thus, the CLD implies that whilst there could be effort from the State which leads to improvement in the system (improved statistics for example), other dynamics comprising the system may operate collectively to eventually bring the system to equilibrium. Thus, the system will demonstrate rapid improvement in the short-term, followed by periods of stability or stagnation in the long-term.

The role of State and industry in MET is a result of many issues in the maritime industry. In Nigeria for example, the government and industry believe that MET institutions are not in the position to provide adequate maritime training for the country's demands (Dada, 2008). Therefore, Ihenetu-Geoffrey (2012) asserts that the Nigerian State ought to play a principal role in the development of the country's MET, by providing security and a conducive environment for teaching and learning, and by formulating policies and strategic plans that will enable the growth and sustained improvement of MET institutions. This necessitates the State's investment in MET, which has been the case in RSA, as the findings suggest. As Struwig, Van den Berg and Hadia (2024: 12) assert "Investment...in South African institutions and stakeholders responsible for ocean economy growth, remain key."

In RSA, national policies such as the New Growth Path - which focuses on creating work opportunities - have the potential to create employment at a large scale (Alpeni & Baur, 2023). In other countries, such as Brazil, MET tuition fees are waived and students are provided with accommodation and a monthly stipend (Lobrigo and Pawlik, 2012) and State institutions such as the Department of Ports and Coasts (DPC) go as far as deciding how many first-year students are recruited into the country's MET institutions. In Greece, the State plays a key role in facilitating funding for MET through contributions from vessels registered in the country and from the European Union (SAMSA, 2011). These strategies, although expensive, have been adopted with the acknowledgement that the maritime industry is key in these countries economic prosperities.

RSA is aiming at securing a competitive spot in the international green hydrogen market by 2050 (Prause, 2024). Thus, the maritime industry has the economic potential to contribute tremendously to development. Various grand national developmental policies and plans including the current National Development Plan (NDP), Operation Phakisa, and the KZN Integrated Maritime Strategy have been adopted by the South African government and operationalised by State institutions as efforts in this direction. However, as the CLD demonstrates, continuous involvement of the State is central to the sustained development of the industry and MET.

8. Conclusion

Maritime industries exert a significant influence on global dynamics and state-led MET institutions influence how such industries operate. Thus, the issues and challenges confronting such institutions are of vital importance in improving the industry and the country as a whole. Significant financial capital is required to obtain the necessary human and physical resources, but this is beyond the grasp of MET public higher education institutions in RSA. Furthermore, these institutions are perceived as neither domestically responsive nor internationally competitive with some calling for more efficiency and effectiveness in universities (Habib, 2016). Furthermore, MET is complex, encompassing physical, social, economic, political elements, etc. and therefore requires the ability see the big picture (Alop, 2021). Thus, Systems Thinking - in its ability to embrace complexity and discern holistic relationships - presented a worthwhile approach for exploring the nexus between State-led maritime education and training, governance and administration in the Republic of South Africa.

References

- Alop, A. (2021). Smart shipping needs smart maritime education and training. In *The 1st International Conference on Maritime Education and Development: ICMED* (pp. 131-142). Springer International Publishing.
- Bonnin, D. and Woods G. (2002) 'Seafarer Training and the Availability of Training Berths: The Case the South African Shipping Industry. Available at: http://www.teta.org.za/documents/Documents/2005Aug10_6/ANNEX%20D.pdf
- Botlanski, L. and Chiapello, E. (2007). The new spirit of capitalism. London: Verso.
- Dada, B. T. (2008) 'Nigeria: Maritime Academy Oron to Get Training Assistance From Norway', Leadership (Abuja) 18 April 2008. Available at: <http://allafrica.com/stories/200804180406.html>
- Chen, B. (2000). An investigation into the current state of Chinese higher MET [Maritime Education and Training] in the light of new international legislation [and] with par legislation [and] with particular reference to STCW'95. (Masters dissertation, World Maritime University) Available from: https://commons.wmu.se/cgi/viewcontent.cgi?article=1193&context=all_dissertations (Accessed: June 13th, 2024).
- eThekweni Maritime Cluster (2011). Business case for establishing a maritime institution in Durban; a great port city becoming a recognized centre of excellence in education, training and research. Durban: South Africa.
- Girardi, G. C., Rubbo, P., Broday, E. E., Arnold, M., & Picinin, C. T. (2024). Comparative Analysis between Quality of Life and Human Labor in Countries Belonging to G7 and BRICS Blocks: Proposition of Discriminant Analysis Model. *Economies*, 12(5), 124.
- Guerreiro, J. (2021). The blue growth challenge to maritime governance. *Frontiers in Marine Science*, 8, pp. 1-16.

- Habib, A. (2016). 'Transcending the Past and Reimagining the Future of the South African University', *Journal of Southern African Studies*, 42 (1), pp. 35-48, DOI: 10.1080/03057070.2016.1121716.
- Hjorth, P., and Bagheri, A. (2006) 'Navigating towards sustainable development: A system dynamics approach', *Futures*, 38, pp. 74-92.
- Ihenetu-Geoffrey C.C. (2012) 'The role of Maritime Academy of Nigeria (MAN) in the development of the maritime industry', *Nigerian Law Students Journal of International Law*. Available at: http://works.bepress.com/chinedu_ihenetugeoffrey/1
- Lobrigo, E. and Pawlik T. (2012) 'The seafaring labour market in Brazil', *Maritime Policy and Management: The flagship Journal of International Shipping and Port Research*, 39 (6), pp. 621-639.
- Lott, A. (2021). Maritime security threats and the passage regime in the Bab el-Mandeb. Available from: <https://site.uit.no/nclos/2021/06/21/maritime-security-threats-and-the-passage-regime-in-the-bab-el-mandeb/> (Accessed: June 12th . 2024).
- Meyiwa, A., & Chasomeris, M. (2020). South Africa's port doctrine: dilemmas and the way forward. *Maritime Studies*, 19(2), 179-191.
- Moorcroft, M. (2017) 'Maritime college for Richards Bay', *Zululand Observer*. Available at: <https://zululandobserver.co.za/110596/maritime-college-for-richards-bay/> (May 3rd , 2016)
- Mthethwa S. N. (2003) The Maritime Industry in South Africa: An opportunity for logistics advancement in the bulk exports. Master of Business Administration thesis. University of KwaZulu-Natal.
- Mthuli, S.A. (2014). An analysis of maritime education and training in Durban: creating an enabling environment for local economic development, (Unpublished Masters thesis. University of KwaZulu-Natal).
- Mthuli, S.A., Nzimakwe, T.I., Biyela, A.C. and Khambule, I. (2018). Exploring policy direction through profiles and expectations of students enrolled in maritime programmes in Durban, South Africa. *African Journal of Gender, Society & Development*, pp.85-105.
- Mthuli, S.A. (2018). A Systems thinking exploration of the challenges facing Maritime Education and Training: The case of public higher education institutions in KwaZulu-Natal, (Doctoral dissertation, University of KwaZulu-Natal). Available from: <https://researchspace.ukzn.ac.za/handle/10413/17345> (Accessed: June 12th, 2024).
- Mthuli, S.A. and Biyela, A.C. (2019). An African perspective on the relationship between hometown location and course enrolment in maritime education training: the case of KwaZulu-Natal, South Africa. *Gender and Behaviour*, 17(1), pp.12429-12449.
- Mthuli, S.A., Ruffin, F. and Singh, N. (2021). 'Define, Explain, Justify, Apply' (DEJA): An analytic tool for guiding qualitative research sample size, *International Journal of Social Research Methodology*, 25(6), pp.809-821.
- Mthuli, S.A., Singh, N. and Reddy, P.S. (2023). Political leadership and Ubuntu for public sector performance in South Africa. In *African Leadership: Powerful Paradigms for the 21st Century* (pp. 27-43). Emerald Publishing Limited.
- Phewa, N.C. (2021). Maritime Education and Training (MET) Curriculum Challenges in the Twenty-First Century. In: Bauk, S., Ilčev, S.D. (eds) *The 1st International Conference on Maritime Education and Development*. Springer, Cham. https://doi.org/10.1007/978-3-030-64088-0_15
- Prause, G. (2024). *The maritime perspective of Africa* (No. 01/2024). Wismarer Diskussionspapiere.
- Ruggunan, S. (2008) Global Transformation of the Contemporary Labour Market for Merchant Navy Seafarers: Case Studies of Filipino, South African and British Seafaring Labour Markets. PhD thesis. University of KwaZulu-Natal.
- Ruggunan, S. (2010) 'The role of the state institutions in shaping the labour market for seafarers: the case of South Africa and the Philippines', *Unisa Press, Politeria*, 29 (2), pp. 42-63.
- Ruggunan, S. (2016) 'An exploratory study of the training of South African officers in the merchant navy', *Maritime Policy and Management*, 43 (3), pp. 309-328, DOI: 10.1080/03088839.2015.1040861.
- Singh, N. and Bodhanya, S.A. (2014). Benefits of examining the sustainability of non-profit organisations from a System Dynamics perspective. *Journal of Contemporary Management*, 11(1), pp.349-366.
- Singh, N. and Mthuli, S.A. (2021). The Big picture of NPO Sustainability: A Qualitative System Dynamics approach. *Systemic Practice and Action Research*, 34(3), pp.229-249.
- Sink, K. J., McQuaid, K., Atkinson, L. J., Palmer, R. M., Van der Heever, G., Majiedt, P. A., Dunga, L. V., Currie, J. C., Adams, R., Wahome, M., Howell, K. & Paterson, A. A. (2021). Challenges and Solutions to develop capacity for Deep-sea Research and Management in South Africa. *South African National Biodiversity Institute*. 35pp.
- South African Maritime Authority/SAMSA (2014). Cadetship Training. Available from: <https://www.samsa.org.za/Pages/SAMSA-Cadetship-Training.aspx> (Accessed: June 13th, 2024).
- South African International Maritime Institute/SAIMI (2014) Feasibility and Viability Study Report. Presentation to regional workshops, September 2014. Availability contact: chris@learningstrat.com.
- Standing, G. (1999) *Global labour flexibility: seeking distributive justice*. London: MacMillan Press.
- Struwig, M., Van den Berg, A., & Hadi, N. (2024). Challenges in the ocean economy of South Africa. *Development Southern Africa*, 41(1), 1-15.
- The Society of Master Mariners South Africa / SOMMSA (2016) Sommsa Policy on Marine Education Training: Maritime Education and Training for Seafarers - the Seafarer's Perspective. Available at: <http://mastermarinersa.co.za>
- Worm, B., Elliff, C., Fonseca, J. G., Gell, F. R., Serra-Gonçalves, C., Helder, N. K., Murray, K., Peckham, H., Prelove, L. & Sink, K. (2021). Making ocean literacy inclusive and accessible. *Ethics in Science and Environmental Politics*, 21, 1-9.