



2024 ENGINEERING INSTITUTION OF ZAMBIA SYMPOSIUM

**From and Engineering to an Entrepreneurial
Mindset: the case of running Zambian
Engineering MSMEs**

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1. **OBJECTIVE OF THE PAPER:**

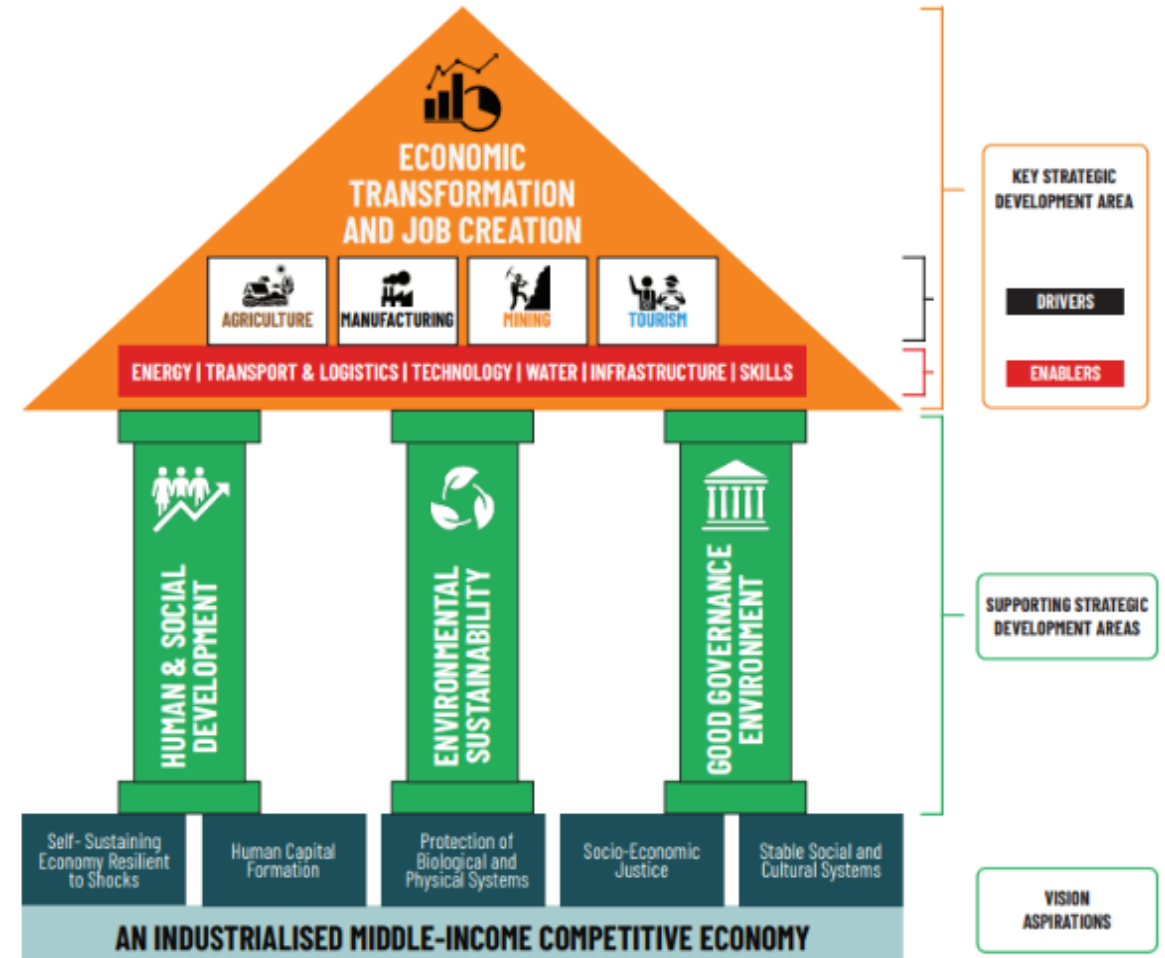
To discuss modern definitions of Entrepreneurship with the view to:

- address the possible sources of the “weak entrepreneurial culture” in Zambia.
- Identify specific challenges faced by engineering MSMEs
- Finally, recommend the need to inculcate an Entrepreneurial Mindset needed to respond to the GRZ challenge of accelerated citizenry participation in economic activities leading to job creation and economic transformation.



INTRODUCTION

In a bid to accelerate citizenry participation in economic activities of Zambia, leading to job creation and economic transformation, the Government of the Republic of Zambia (GRZ), through the Eighth National Development Plan (8NDP), has identified and targeted promotion of decent work, enterprise development and technical, vocational and entrepreneurship skills training to reduce the 2.9 million (30.6 percent) financially excluded adult population (MoFNP, 2022).



2. METHODS AND MATERIALS

Literature review of:

- Two scholarly articles on entrepreneurship with local university staff authorship (Choongo, *et al.*, 2020), (Chabala, 2018).
- A report on entrepreneurship training for engineering students in local university curricula (Musonda, *et al.*, 2019) from UNZA presented during the Engineering Institution of Zambia (EIZ) 2019 annual Symposium.
- Articles written by various authoritative personalities belonging to organizations such as Harvard School of Business.
- Daily Mail article on the SME Ministry dated 8th January 2024.



3. FINDINGS FROM LITERATURE REVIEW

3.1 DEFINITIONS OF ENTREPRENEURSHIP

Historical Definition of Entrepreneurship:

“buying a product at a certain price and selling it at an uncertain price.”

Modern definition of Entrepreneurship - According to Harvard Business School: “Entrepreneurship is the pursuit of opportunity beyond resources controlled” (Eisenmann, 2013).



“**pursuit**” implies a singular relentless focus. Entrepreneurs are said to have a sense of urgency rarely seen in established companies.

“**Opportunity**” implies an offering that is **novel** in one of more of the following four ways:

- Pioneering a truly innovative product
- **Devising a new business model**
- Creating a better or cheaper version of an existing product
- **Targeting an existing product to new sets of customers.**



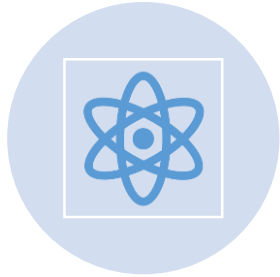
“**Beyond resources controlled**” implies **resource constraints** faced by entrepreneurs.

As entrepreneurs pursue novel opportunities beyond resources they control, they assume risk (Eisenmann, 2013).

TYPES OF BUSINESS RISK

- **Financial risk:** This type of risk will be in the form of financing and will depend on whether external capital required will be available on reasonable terms.
- **Execution risk:** This risk involves the entrepreneur’s ability to attract the necessary personnel or partners to fulfill the SME’s plan, especially when pursuing a novel innovation.





Technology risk: This occurs when the novel solution requires new technological or scientific breakthroughs.



Demand risk: whether the designed product will attract clientele (Eisenmann, 2013).



All these types of risk and other expected, as well as unforeseen challenges in running SMEs require the entrepreneurial engineer to take **calculated risks**.



“**Calculated risk-taking** is operationally defined as the ability to deal with incomplete information and act on a risky option, that requires skill, to actualize challenging but realistic goals.” (Carosa, 2020).

Modern entrepreneurship also highlights the importance of devising new **business models**. A business model **articulates the logic** and **provides data and other evidence that demonstrates how a business creates and delivers value to customers**. It also outlines the **architecture of revenues, costs, and profits associated with the business enterprise delivering that value** (Teece, 2010). Thus, more than a financial plan, the **business model actually embodies the business concept**.



In Zambia the likelihood of **copy behavior approaches** (Choongo, *et al.*, 2020) is a real threat in business. Well thought out and developed business models can help a business to be sustainable and even thrive. For example, businesses based on **formal relationships with Original Equipment Manufacturers (OEMs)** stand a better chance of being more competitive than others that may trade in an identical product yet source their merchandise from **supply chains which are fraught with middlemen.**



3.2 Importance of an Entrepreneurial Mindset

- The entrepreneurial mindset is explained as the ability to quickly sense multiple opportunities, take action and persist through uncertainty and failure. The main attributes of an entrepreneurial mindset include, among others:
 - **Empathy** – developing a deep understanding of customers.
 - **Improvisation** – being able to quickly react to an unexpected opportunity.
 - **Creative problem-solving** – coming up with multiple unique solutions.
 - **Self-leadership** – managing one's thoughts and actions to increase motivation. This quality leads to perseverance.
 - **Believing in oneself (self-efficacy)** – focusing on one's strengths (Hancock, 2022).





Deliberately reflect on why and how you do things

Remind yourself of your goals

Select realistic targets to work towards

Providing yourself with positive reinforcement when you achieve a goal

Reflecting on mistakes in order not to repeat them – not self-criticism

3.3 Current Development of Entrepreneurship in Zambia

The GRZ introduced the Ministry of Small and Medium Enterprises (SMEs) Development in 2022 (ZDA, 2022).

MSMEs account for 97 percent of all businesses (enterprises), contributing 70 percent of the gross domestic product (GDP), and 88 percent of employment creation (Tembo, 2024).

GRZ established the Citizens' Economic Empowerment Commission (CEEC) through the Citizens' Economic Empowerment Act number 9 of 2006 to foster broad-based economic empowerment in Zambia.

Zambia Development Agency (ZDA) is responsible for fostering economic development in Zambia by promoting and facilitating trade and investments through a coordinated private sector led strategy.





Academia and Entrepreneurship

- The Copperbelt University (CBU) has taken an initiative to introduce entrepreneurship studies as an elective in most faculties with the aim of encouraging graduates from CBU to consider setting up start-ups rather than looking for formal employment (Choongo, *et al.*, 2020).
- That UNZA should revise its engineering curriculum and ensure that content should:
 - focus more on entrepreneurship rather than on employability.
 - strike a balance between theory and practice.
 - have specific learning outcomes that students should meet.
 - demonstrate local significance and not developed for monolithic industry.



That UNZA should form synergies with the Tripple Helix (Government-University-Industry).

Particularly that UNZA should build strong relations with local industries, and that UNZA



should recommend to GRZ on policies that enable an excellent technological ecosystem (Musonda, *et al.*, 2019).

3.4 Challenges faced by Engineering MSMEs



Limited access to affordable financing and capital - A recent survey among engineering MSMEs revealed that access to affordable capital most pressing problem among 66.7 % of the respondents



Lack of access to local and foreign markets - access to markets and opportunities was the next most pressing problem among 44.4 percent of the participating MSMEs (Mwale, 2023)



Lack of innovation



Weak entrepreneurship culture,” - Minister of Small and Medium Enterprises (SMEs) of the GRZ (Tembo, 2023).



First National Bank (FNB), National Savings and Credit (NATSAVE) bank, have developed and extended services such as order financing and invoice discounting.

4.0 Discussion on Findings

- Creating a better or cheaper version of an existing product in the Zambian context could be likened to the drive for import substitution.
- Identify OEMs either directly or through assistance from ZDA, with whom they can form partnerships such as joint ventures or franchises for the supply of the OEM's products to the mines.
- Study local resources that could be used to replace components of the subassemblies. Through acquiring copyright, they could substitute parts of subassemblies with locally manufactured parts.
- Engineers would need basic knowledge in marketing and need to employ or partner with marketers to penetrate new markets with existing products.



5.0 Conclusions



In practice, the entrepreneurial engineer or entrepreneurial organization, such as an engineering SME, will explore opportunities to provide novel products and services aimed at addressing existing and unmet customer needs.



Sustained profits for engineering SMEs will lead to increased economic benefits and job creation.

5.0 Conclusions - continued



Entrepreneurial engineers stand a chance to minimize the problem of copy behaviour, which involves imitative as opposed to innovative business practices.

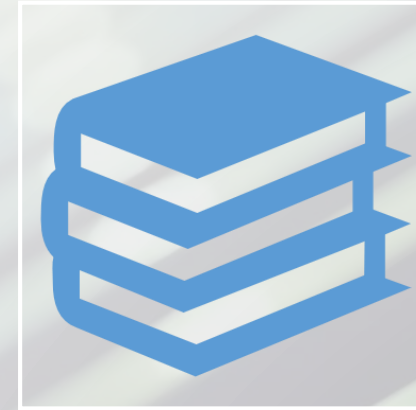


Technical success does not automatically translate into market success. As such engineers must acquaint themselves with business knowledge and skills in developing business models that will deliver success in the marketplace.

5.0 Conclusions - continued



Tertiary educational institutions must be encouraged to entrench entrepreneurship training in their curricula to improve intentional entrepreneurship among college and university graduates.



Engineers owning SMEs to contribute to a vibrant triple helix relationship with government and tertiary learning institutions by taking up students on attachments and mentorship programs. Stir up debate with local tertiary institutions on student fitness-for-purpose training needs by defining their expectations and pledging their contributions to technical and entrepreneurial training colleges and universities.

5.0 Conclusions - continued

Zambian engineers, through the EIZ to explore collaboration with the ZDA to improve opportunities for Zambian engineering SMEs to form joint ventures or franchises with foreign companies intending to bring FDI into Zambia. Acquiring technical and industrial skills from FDIs can help local SMEs develop capacity to set up LDIs with capacity to innovate new products for the export market, leading to an increase in the share of foreign exchange earned from NTEs.



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