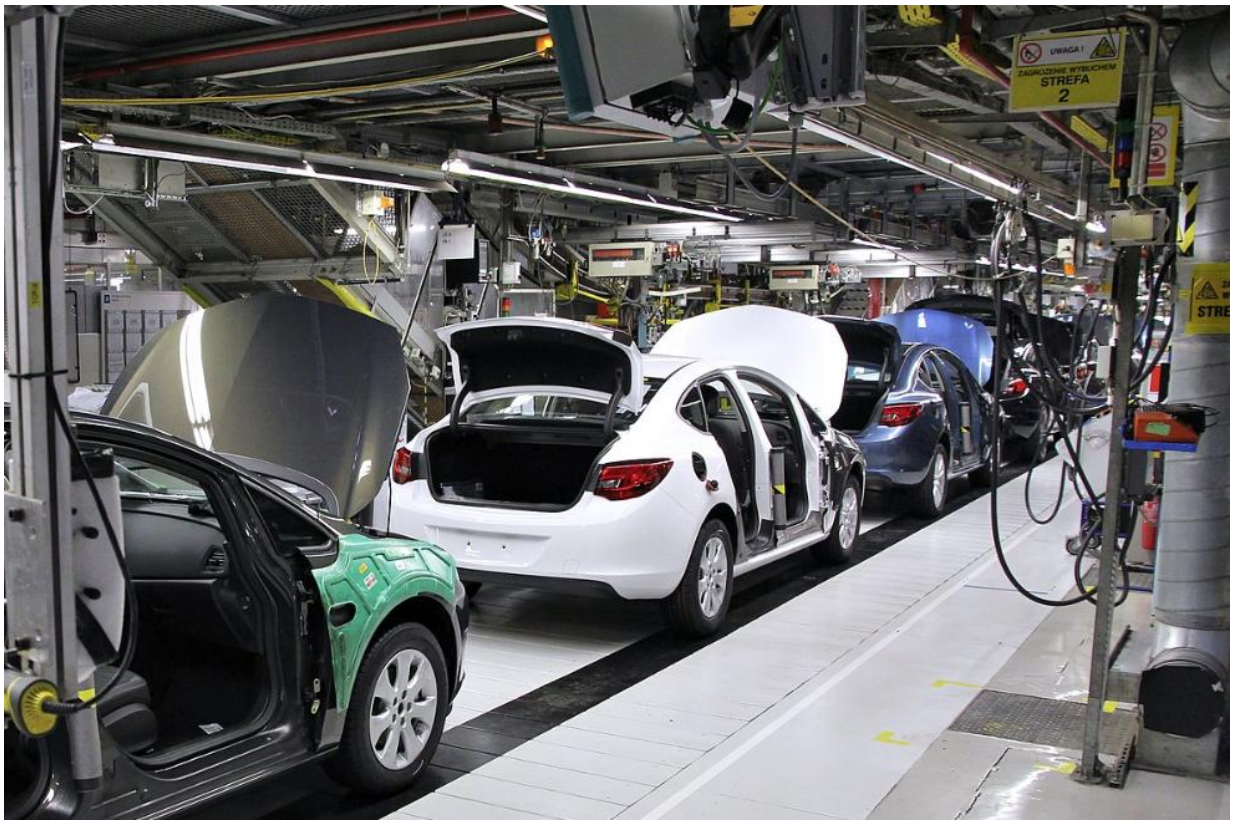
African Skills and Development Group Ltd

FROM MIKE VALLEZ™

Newsletter No. 6 **July 12, 2025**

Manufacturing Skills and Technologies for Africa



GFP International is offering vocational schools and universities across Africa with strategies, solutions and concepts to solve one of the Continents its biggest problems:

Lack of Domestic Manufacturing Capabilities

Seventy percent of Africa's foreign trade is associated with the export of a wide range of commodities. These persistent trade imbalances lead to currency devaluations, and force countries to rely on foreign financing, which often results in win-lose transactions, lack of job creation, and other negative consequences.

Over 60% of all manufactured goods involve some kind of welding. The lack of quality welding training across Africa is holding back the manufacturing industries and economic balance.

Invitation to join GFP International at the FABTECH 2025 Convention in Chicago

2025 FABTECH Theme:

The Future of Manufacturing is Here

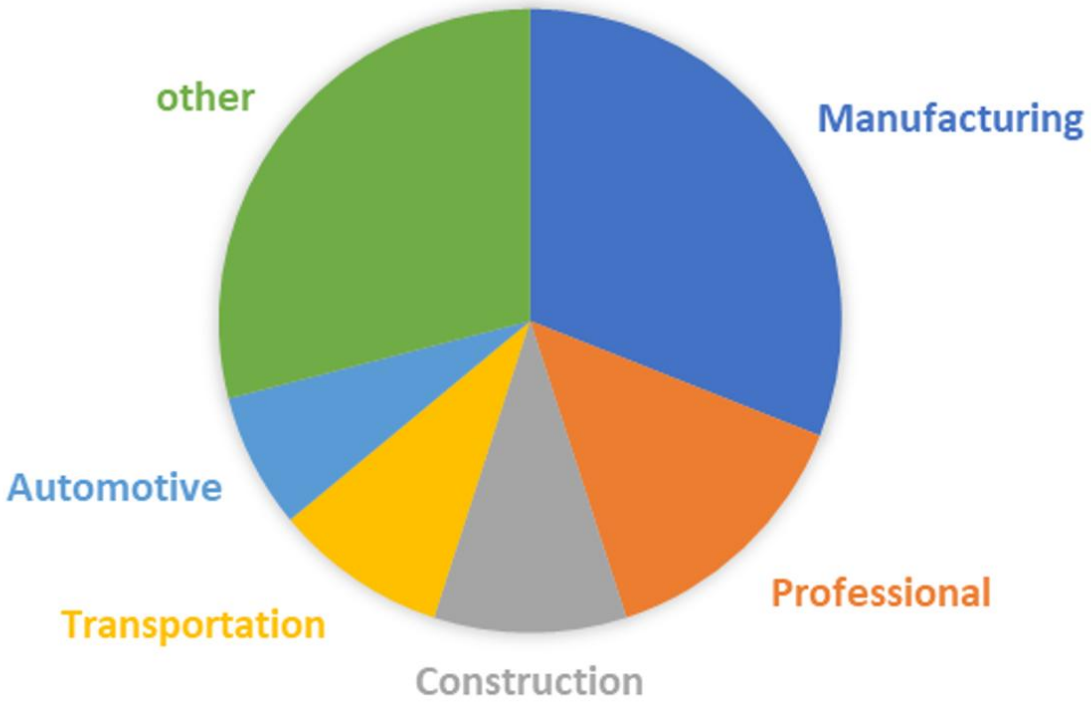
We would like to invite our African friends in the vocational, academic, business and government circles to consider joining us at this year's **FABTECH** Convention from September 8 to 11 in Chicago Illinois, USA. This annual event attracts 45,000 attendees which include the leading technologists, experts, and equipment / service providers in the welding, fabrication and manufacturing spaces. Follow this link for details and registration instructions:

https://www.fabtechexpo.com/

GFP International has identified the manufacturing sector as one which would benefit from capacity building around industrial welding. As a result of this, we have included robotic welding training as part of our curriculum and facilities plans. After continuing our needs assessment discussions with various training and education institutions across Africa, we have concluded that both the skill training and engineering curricula needed to serve industrial development in manufacturing in the Global South need refreshment.

Manufacturing Skills and Technologies for Africa

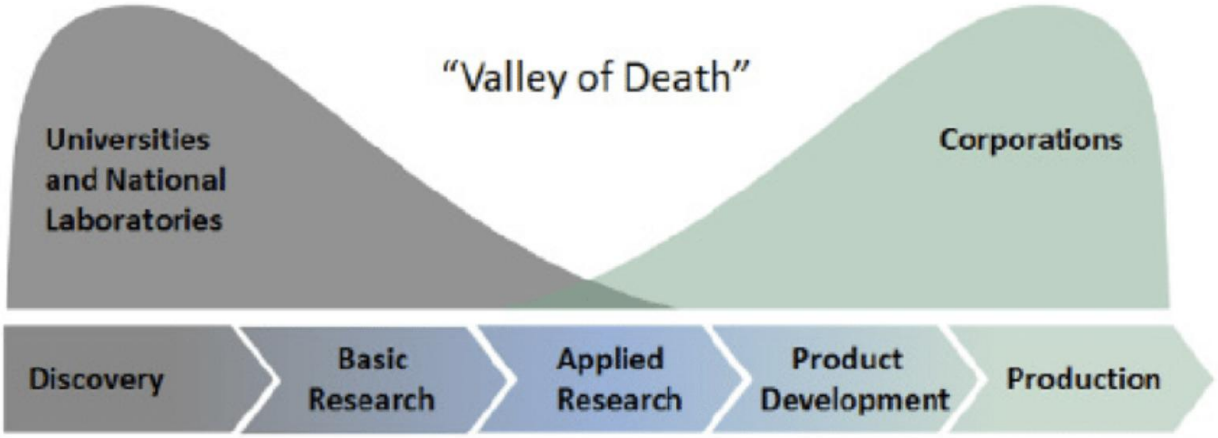
GFP International has identified the manufacturing sector as one which would benefit from capacity building around industrial welding. According to data from US sources, the breakdown of welding employment is shown in the pie chart below.



As a result of this, GFP has included robotic welding training as part of its curriculum and facilities plans. After continuing our needs assessment discussions with various training and education institutions across Africa, we have concluded that both the skill training and engineering curricula needed to serve industrial development in manufacturing in the Global South are needed.

Filling The Gap in the "Valley of Death"

The graphic below illustrates the gap which often exists between universities and the corporations who need educated staff to succeed in their businesses, often referred to as the "Valley of Death" as depicted below.[1]



To be successful in filling this gap that exists in Africa, welding schools should consider working with institutions of higher learning to combine skill development with the engineering disciplines needed to serve the manufacturing sectors which are identified through a feasibility analysis to identify which industries can be attracted to operate in the local economy.

In addition to the academic, educational and training institutions, this analysis and engagement may need to engage government, industry, and business. For example, the North American Free Trade Agreement (NAFTA) was a trade agreement signed in 1992 by Canada, Mexico, and the United States. Among other things, it led to many American auto manufacturers locating their factories in Mexico to take advantage of the low cost of labor and absence of the United Auto Workers (UAW) trade union in Mexico. To disempower trade unions, many US states implemented what is called the "Right to Work" rules, that prohibited trade unions from requiring workers to joining trade unions. These states were referred to as "open shop" states. Manufactures used their political power to reduce the power of trade unions which had previously required workers to join the trade unions. This adoption of "open

[1] The Valley of Death, the gap between Research and (mature) product development, source: https://www.sri.com/blog/brazil-visits-sri-discussits-economic-development-roadmap-last accessed 23-12-2015.

shop" rules helped the bottom line of the automakers but hurt domestic workers in the United States.

Today, the current Republican party, under the Donald Trump administration, is implementing tariffs to help domestic manufacturers be more competitive, which also helps the US working class, shifting large voting blocks to the Republican Party.

In the case of Kenya, can government trade policies be coordinated with the educational and training institutions to establish the foundation for meaningful positive change that will contribute to job growth and economic expansion? Who will be the winners and losers in such changes? Domestic Kenyan businesses which are engaged in foreign auto imports will likely resist any initiatives which will impact their profitability and so forth. Based on this analysis and potential policy action by government and academia, specific training programs and skill development agendas can be implemented.

GFP International knows that different welding skills support different industries. The table below illustrates the welding processes which are utilized in different applications.

The following table identifies some of the common welding processes used in various industries.[2]

[2] https://seaberyat.com/en/types-welding-industries/

	COMMON WELDING PROCESSES	BENEFITS
Aerospace	TIG Welding (GTAW)	Offers exceptional control overheat input and produces clean, precise welds.
	Lazer Beam Welding	Used for joining intricate components with minimal heat-affected zones.
Railway	Thermit Welding	Ideal for welding rails in situ, minimizing disruptions to railway
	Flash Butt Welding	Commonly used to join rails together seamlessly.
Automotive	Resistance Spot Welding	Used for joining sheet metal parts quickly.
	Robotic Welding	Automated systems for high-volume production, ensuring consistent weld quality.
Manufacturing	Gas Metal Arc Welding (GMAW)	Versatile and suitable for various materials like steel, aluminum, and stainless steel.
	Spot Welding	Efficient for joining sheet metal components in mass production.
Construction	Stick Welding (SMAW)	Common for on-site welding due to its versatility and ability to work in various weather conditions.
	MIG Welding (GMAW)	Ideal for fast, efficient welding on steel structures.
Oil & Gas	Flux-Cored Welding	Ideal for welding thick materials and in outdoor environments.
	Submerged Arc Welding (SAW)	Efficient for welding long seams in pipelines.

How does one define *manufacturing technologies*?

There is a growing emphasis by African governments to support domestic manufacturing, which means that the skills and technologies needed for manufacturing need to be enhanced and improved.

In accordance with an AI search, manufacturing technologies are defined as follows:

Manufacturing technology encompasses the tools, processes, and systems used to create products, from design and development to production and maintenance. It involves applying engineering, scientific, and industrial knowledge to improve efficiency, quality, and sustainability in manufacturing operations. This field includes areas like automation, simulation, data analytics, and digital twins, all aimed at optimizing the manufacturing process.

Here's a more detailed breakdown:

Key Aspects of Manufacturing Technology:

- ***Design and Development:***

  Manufacturing technology plays a crucial role in designing products, including the use of CAD (Computer-Aided Design) software and simulation tools to optimize designs for manufacturability.

- ***Production Processes:***

This includes the selection and implementation of machinery, automation systems, and production lines to efficiently manufacture products.

- ***Materials and Processes:***

  Manufacturing technology also involves the selection and application of materials, as well as the development and optimization of various manufacturing processes like machining, casting, and additive manufacturing.

- ***Quality Control:***

  Monitoring and controlling product quality throughout the manufacturing process is essential. This includes the use of sensors, inspection systems, and data analysis to ensure products meet specifications.

- ***Automation and Robotics:***

  Automating repetitive tasks and using robots to perform complex operations can significantly improve efficiency, reduce costs, and enhance safety.

- ***Digital Manufacturing:***

  This involves leveraging digital technologies like simulation software, data analytics, and connected systems to optimize the entire manufacturing process.

- ***Sustainability:***
  Manufacturing technology also plays a role in developing more sustainable manufacturing practices, such as using energy-efficient equipment, reducing waste, and minimizing environmental impact.

Examples of Manufacturing Technologies:

- ***Digital Twins:***

  Creating a virtual replica of a product or production process to simulate and optimize performance.

- ***Additive Manufacturing (3D Printing):***

  Building three-dimensional objects layer by layer, often used for prototyping and customized parts.

- ***Industrial Robotics:***

  Using robots for various tasks in manufacturing, including assembly, welding, and material handling.

- ***Automation Systems:***

Implementing automated systems for production lines, material handling, and other repetitive tasks.

- ***Advanced Materials:***

  Utilizing new materials with enhanced properties for improved product performance.

- ***Smart Manufacturing:***
  Integrating sensors, data analytics, and other technologies to create connected and intelligent manufacturing systems.

Importance of Manufacturing Technology:

- ***Increased Efficiency:***

  Manufacturing technology enables faster production cycles, reduced cycle times, and optimized resource utilization.

- ***Improved Quality:***

  By implementing quality control systems and using advanced measurement tools, manufacturing technology helps to produce higher quality products with fewer defects.

- ***Reduced Costs:***

  Automation, optimized processes, and efficient resource management contribute to lower production costs.

- ***Enhanced Safety:***

  Automated systems and robots can take over hazardous tasks, improving worker safety.

- ***Increased Competitiveness:***
  By adopting advanced manufacturing technologies, companies can gain a competitive edge by producing better products at lower costs.

Concluding Thoughts

GFP International is engaging with universities to develop welding schools of excellence in conjunction with training engineers and technologists in manufacturing technologies.

When considering the landscape of the current political, social, and donor environments, GFP believes that a strong case can be made that will attract and expand a broad constituency to support such an innovative training and

manufacturing technology department at the leading institutions of higher learning in Africa. There is still a legacy of neo-colonial attitudes that view Africa as a source of low-cost commodities to support the existing manufacturing industries in the global north. However, there are a growing number of domestic and international constituencies that support the development of domestic African manufacturing where the value-added industries can thrive and support job creation and economic development in Africa.

GFP International is aligned with the latter constituents who believe that more domestic African manufacturing and commodity processing is essential to support domestic job growth and economic prosperity. However, our eyes are open to the fact that there are both domestic and international interests which would like to keep African countries in their status as sources of cheap commodities, to support the existing manufacturing and value-added industries in the global north. Furthermore, it will require courage and foresight by African governments to adopt broad trade policies that support domestic manufacturing and commodity processing, while also investing in the training and engineering disciplines needed to support such transitions.

End.

"Industrial Welding Training is the Key to Unlock Africa's Human Potential and End Severe Poverty in 10 Years"

Eng. Michael J. Vallez, Founder, GFP International