



# The Nigerian Institution of Mechanical Engineers

(A division of the Nigerian Society of Engineers)

## Industry Academia Parley

at

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By

**Engr. Aminu Jalal, FNSE, FNIMechE, FNIM**

# Outline

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- Industry-Academia Relationship
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# Introduction

- Academia is a community of scholars and researchers who are engaged in the pursuit of knowledge through research and teaching.
- The primary purpose of academia is to advance knowledge and understanding in a particular field or discipline through original research, and to share that knowledge through teaching and dissemination to the wider community.

# Introduction

- Industry refers to the production of goods and/or services through the use of labor and machines, tools, and technology.
- It can also refer to a specific sector of the economy, such as the automotive industry or the technology industry. Industry is a key driver of economic growth and development.

# Industry and Academia relationship

- The foregoing shows that the relationship between industry and academia should be driven by a desire to advance knowledge and innovation, and to translate that knowledge into practical applications that can benefit society.
- This relationship is mainly through two ways: research and development partnerships and the training of future leaders and professionals.

# Industry and Academia relationship

- These research and development partnerships can take many forms, from formal collaborations between universities and companies to informal relationships between individual researchers and industry professionals.
- These partnerships allow industry and academia to combine their strengths and expertise in order to tackle complex research problems and develop new technologies and products.

# Industry and Academia relationship

- The other important aspect of the relationship between industry and academia is the role of universities and other research institutions as training grounds for future industry leaders and professionals.
- Many students who study in academia go on to take leadership roles in industry, bringing with them the knowledge and skills they acquired while in academia. This can be beneficial for both academia and industry.

# Industry and Academia relationship

- The relationship between Industry and Academia in Nigeria is mainly in training of future leaders and professionals. This relationship can be deepened so that our imported machinery can be modified to suit our needs and replicated, thereby improving our technological capacity.
- Unfortunately, some universities curriculum does not meet industry requirements, for example in automobile and mechanical engineering.



# Industry and Academia relationship

- Since the 1960s and especially since 1996, automobiles contain mechatronic systems for safety, exhaust pollution control and convenience of motorists. (Mechatronics is the field of engineering that combines mechanics, electronics, and computer science to design and control advanced systems, such as robotic systems, automated manufacturing systems, and intelligent transportation systems)
- Peugeot Automobile Nigeria and Mercedes-Benz Anammco had to introduce the teaching of mechatronics in their training schools in the late 1990s as our mechanical engineering graduates were deficient in the subject. MB-ANAMMCO furthermore introduce the course at a diploma level at the Institute of Management and Technology, Enugu

# Industry and Academia relationship

- Unfortunately, the situation has not changed.
- The National Universities Commission (NUC) in 2021 released a revised “Core Curriculum and Minimum Academic Standards for the Nigerian University System” for 29 Engineering courses in our universities.
- However, the reviewers were all from universities and the NUC. The sole industry representative was the former president of COREN for all the courses.

# Industry and Academia relationship

- Unsurprisingly, there are major omissions in the course content for Automotive and mechanical engineering, which are my areas of knowledge.
- The omissions in automotive engineering include:
  - Automotive exhaust pollution and control;
  - Automotive mechatronics;
  - Automotive assembly (manufacturing) operations; and
  - Electric vehicles (surprising as in 2022, 10% of all vehicles sold were electric, up from 1% in 2017, and many countries (and auto companies) have pledged to only allow the manufacture of electric vehicles from 2035, or 12 years from now.)

# Industry and Academia relationship

- The omissions in mechanical engineering include:
  - Mechatronics;
  - Robotics:
    - many manual operations in factories like welding, painting, conveyance, etc. are done by robots; and
  - Nanotechnology:
    - Nanotechnology is the manipulation and engineering of materials and devices on a scale of 1 to 100 nanometers. This field involves the study, design, and manipulation of matter at the atomic and molecular level, and has applications in industries like electronics, medicine, energy, and materials science.
    - The following disciplines include nanotechnology in their course content: Agricultural and Bio systems Engineering, Chemical Engineering and Materials and Metallurgical Engineering)

# Conclusions

- Academia and industry should therefore collaborate more with each other to combine their strengths and expertise in order to:
  - train our of future leaders and professionals with the appropriate skills needed by our economy;
  - to carry out research to modify our imported machinery to suit our needs and replicate same, thereby improving our technological capacity; and
  - Develop new machinery and equipment required by our economy.

- Thank you for your attention!
- Engr Aminu Jalal.
  - [aminujalal@gmail.com](mailto:aminujalal@gmail.com)