

**PROMOTING QUALITY GEOSCIENCE EDUCATION IN  
NIGERIA - CHALLENGES AND POSSIBILITIES: POSSIBLE  
AREAS OF COLLABORATION WITH OIL AND GAS  
INDUSTRY**

**A Paper Delivered by the Vice-Chancellor, University of Ilorin, Ilorin,  
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## **Introduction**

**Geoscience is a pure science discipline that deals with knowledge of the earth evolution, constituents, and processes. It covers the study of the earth and includes all non-living parts of our environment, and everything below the earth's surface (Australian Museum, 2004). In many ways, it relates to other areas of sciences and engineering, thus it is an applied science. It is a vast and vibrant discipline with several branches such as geochemistry, geophysics, petroleum geology, engineering geology, and a host of others.**

**UNESCO (n.d.) asserts that education is the primary agent of transformation towards sustainable development. It increases people's capacities to transform their visions for society into reality. In addition, education not only promotes scientific and technical skills, it also provides the motivation, justification, and social support for pursuing and applying them. UNESCO further asseverates that quality education must have the following eight basics:**

- Ø supports a rights-based approach to all educational endeavours. That is, education is a human right, and thus quality education supports all of the human rights;**
- Ø is based on the four pillars of education for all which are: learning to know, learning to do, learning to live together and with others, and learning to be (Delors, et al., 1996);**

- Ø perceives the learner as an individual, a family member, community member, and a global citizen who should be educated to create individual competency in all four roles;
- Ø upholds and conveys the ideals of a sustainable world, that is, a world that is just, equitable, and peaceable, in which individuals care for the environment to contribute to intergenerational equity;
- Ø takes into consideration the social, economic, and environmental contexts of a particular place and shapes the curriculum or programme to reflect these contexts. That is, **quality education must be locally relevant and culturally appropriate;**
- Ø is informed by the past (e.g. indigenous and traditional knowledge), which is applicable to the present, and prepares individuals for the future;
- Ø builds knowledge, life skills, perspectives, attitudes and values; provides the tools to transform current societies to more sustainable societies; and
- Ø is measurable, that means the quality can be evaluated.

These eight basic principles can be used to evaluate the geoscience education curriculum (the Approved Minimum Academic Standards [AMAS]) of the Nigerian National Universities Commission (NUC) used in the education of geoscientists in the Nigerian universities. This presentation will address the past, present, and the future of geoscience education in Nigeria, and its relevance and contributions to the oil and gas industry.

## **Emergence of Bodies of Geoscientists in Nigeria**

The first known professional body of geoscientists in Nigeria was the Nigerian Mining and Geosciences Society (NMGS) with over five decades of existence. The NMGS formed the platform for the emergence of Nigerian Association of Petroleum Explorationists (NAPE) in the 70's to cater for professional concerns of the hydrocarbon industries. In the recent past, the Federal Government promulgated the Council of Mining and Geoscientists (COMEG) by Decree 40, of 1990. This resulted in the formation of the Council about five years ago to regulate professional registration of geoscientists and engineers in Nigeria. The Council (COMEG) among others is charged with prescribing and enforcing the minimum standards of education and experience to be obtained by persons qualified to practice as registered mining engineers and geoscientists. Part V of the Decree which deals with training of mining engineers and geoscientists states, among others, that the Council may approve for the purpose of Section XI of the Decree "any course of training which is intended for persons seeking to become members of the profession, under this Decree and which the Council considers, is designed to confer on persons completing it sufficient knowledge and skill for the practice of the relevant profession" (A 607).

It should be underscored that none of the professional associations of geoscientists and mining engineers has come up with required professional standards (academic and technical) for entry into the profession. Although the on-going effort of COMEG to address this shortcoming through the development of appropriate standards is appreciated.

## **Possible Areas of Collaboration between the Universities and the Nigerian Oil and Gas Industry**

The oil and gas industry and the universities have the need for symbiotic relationship, which should be a mutually benefiting collaboration. This is because the products of the institutions

provide the needed manpower for the sustenance of the oil industry, while the industry assists in training and providing employment for graduates.

Specific areas of collaboration include: field course support, students' industrial work experience scheme, scholarship and bursary awards, staff exchange, consultancy, provision of infrastructural, equipment, and instructional materials, professorial chair endowments, vehicle donations for universities, and sponsorship to academic and professional fora, among others.

In return, the industry should enjoy support for their research and development (R & D), quick response to industrial emergencies, commissioned and special projects, and sufficient pool of employable graduates in the oil industry, among others, from the universities. Some of the challenges affecting the geoscience education in Nigeria are highlighted below.

### **Challenges of the Geoscience Education**

Although geoscience education in Nigeria has great promises, it also has a lot of challenges. Some of these challenges are:

- ✓ **Finance:** The funds required to get equipment used industrially is not available within the university system budget. For instance, an average microscopic investigation of a sample costs about ₦8000, where a student needs between five or more sample tests for minimal investigation of most researches, totalling ₦40,000. This is well above the financial capability of an average Nigerian student. In addition, students do not have the required tools and basic equipment for their study as brooding geoscientists. Funding also affects staff development programmes, research, and international collaborations.

- ✓ **Quality of Graduate Output:** Non-synchronisation of graduate output with national and industrial needs results in overproduction of graduates in certain areas and underproduction in certain critical areas, often at variance with the local industrial needs. This is exemplified by the press statement of Mr. Afe Mayowa, the Chairman, NAPE University Assistance Programme on the inadequacy of the content of geoscience education to provide the required entry level cognate experience to Nigerian geoscience graduates (Punch, 2008).
- ✓ **Decay in Facilities:** Most units can only boast of obsolete non-repairable equipment. Moreover, infrastructural and equipment inadequacies have been further compounded by high students' enrolment.
- ✓ **Centralised Database on Geoscience:** Lack of centralised database on geological researches and publications, thereby hampering collaborative efforts within the academics, and between the academics and professionals in the industries.
- ✓ **National Geoscience Centre:** Lack of a National Geological Centre which can house needed information and state of the art equipment which can improve geoscience education and knowledge exchange.
- ✓ **Neglect of Indigenous Knowledge:** Inability to benefit from indigenous and traditional knowledge by the graduate geoscientists has resulted in lack of connection between the past and the present, or in other words, the traditional and contemporary geoscience practitioners.
- ✓ **Lack to access to ICT infrastructure and equipment:** The lack or inadequacy of ICT facilities has created problem for the academic and student geoscientists to tap from global

network of ideas and knowledge. Field activities in geoscience generate lots of data which can conveniently be satisfactorily analysed and interpreted using ICT facilities if generously available. As at now, Internet access is still limited to most Nigerians.

- ✓ **Lack of Standard:** There is lack of uniform standard to measure the quality of geoscience education. The present benchmark is determined by the NUC only. As earlier stated, professional bodies are yet to harmonise the different types of degree in institutions (e.g. B. Sc. and B. Tech.). There are also institutions running postgraduate diploma without any quality control.

### **Possibilities**

Having highlighted the challenges of the geoscience education above, it is pertinent to state that efforts are being made to address, correct, and improve the quality of geoscience education. In order to ensure the achievement of this, the following are recommended:

- ü Institutions should recognise and highlight their areas of strength and then build on it as a centre of excellence in those areas. For instance, University of Ilorin is noted for having a strong field geology orientation, petroleum geology, sedimentology, mineral exploration, engineering and hydrogeology, with up-coming improvements in geophysics and petrology.
- ü Department of Geosciences should collaborate with other areas of science to address problems or issues emanating from technological and economical activities. For instance, in trying to solve the problem posed by non-decomposition of polymer waste and related ground water complications, our University through the collaborative effort between the Department of Geology and the Chemistry Department developed oleosorbent particles that have been proved applicable for oil spill management (Kareem, 2005).

- ü **Staff exchange should be encouraged between the academics and the professionals in the oil and gas industry. This will promote cross fertilization of ideas, knowledge, and skills. In addition, the town and gown relationship can be promoted and encouraged.**
  
- ü **Students' work experience scheme should be restructured to ensure that students are exposed to a longer work experience period in the industries (for at least six continuous months), as desired by the Nigerian Employers' Consultative Association (NECA). This has the potential of furnishing the students with relevant skills which are desired in the industries. In addition, students can be exposed to emerging needs of the industry thereby providing them with usable skills which they cannot gain with the present three months attachment duration.**
  
- ü **A policy should be in place to make it mandatory for academic staff to also participate in teachers' industrial work experience scheme with the envisaged goal of developing skills to match the emerging needs of the curriculum and industrial requirements.**
  
- ü **In a Unit Operation version of tackling complex industrial problems, geoscience discipline should be exposed to larger public interest to facilitate their participation. Demystifying geoscience will also allow graduates with entrepreneurial attitude to be self-employed in the service sector of the oil and gas and other pertinent industries.**
  
- ü **Appropriate curriculum that will serve as standard should be developed by the NUC, COMEG and other professional geoscientists' bodies, with necessary input from relevant stakeholders (the society, students, academicians, geoscientists in the industries, etc.). Top-down approach cannot ensure quality in design and implementation.**

## **Conclusion**

The challenges in ensuring quality geoscience education seem daunting, however, they are surmountable. Problems of funding, infrastructural and equipment decay, proliferation of geoscience departments, lack of access to ICT facilities, and non-availability of geoscientific database, among others, can be addressed through the involvement of all stakeholders. The oil and gas industry should improve on their collaboration with the universities in promoting quality geoscience education.

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