



**ROLE OF COMEG IN REGULATING
GEOSCIENCE AND MINING
EDUCATION IN NIGERIA'S TERTIARY
INSTITUTIONS**

DECREE No. 40, 1990: Defines the roles of COMEG as follows;

- (a). Prescribing and enforcing the minimum standards of education and experience to be obtained by persons qualified to practice as registered mining engineers and geoscientists;
- (b). Prescribing and enforcing the code of conduct of registered mining engineers and geoscientists;
- (c). Securing, in accordance with this Decree, the establishment and maintenance of a register of persons entitled to practice as mining engineers and geoscientists and reviewing those standards from time to time, as circumstances may require;



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(d). Regulating and controlling the practice of mining engineering and geosciences in all its aspects and ramifications;

(e). Maintaining discipline in the profession in accordance with this Decree; and

(f). Performing such other functions which in its opinion are calculated to facilitate the carrying on of its activities under this Decree.

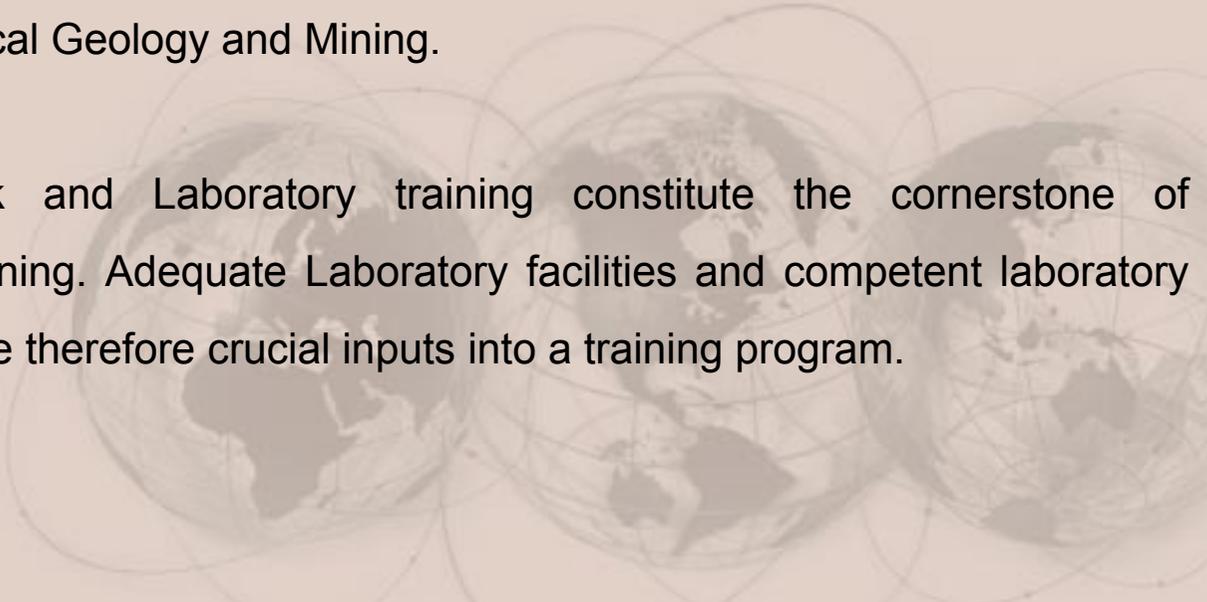




PREAMBLE

We need to assess the role of the Geoscientist/Mining Engineer in Nigeria today and to evaluate the relevance and effectiveness of the different methods of training. The needs of the nation must dictate the method of training. In order to develop any country's natural resources, Applied Geoscientists and Miners are required; this means that during the training, emphasis should be placed on the more applied aspects of geology and mining. This must however, not be to the detriment/neglect of Pure/Theoretical Geology and Mining.

Fieldwork and Laboratory training constitute the cornerstone of geological training. Adequate Laboratory facilities and competent laboratory technicians are therefore crucial inputs into a training program.





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There has been a phenomenal growth in the numbers of institutions training Geoscientists and Mining engineers in Nigeria from one (1) in 1960 to close to ninety (90) in 2014. With the attendant astronomical rise in the number of geoscientists graduated and now being graduated annually. A large number of polytechnics now offer courses in mining engineering unlike some decades ago when only Kaduna Polytechnic did. Most of the earlier generations of Nigerian trained Geoscientists and Mining engineers were generally well-trained by both expatriate and the few indigenous Nigerian staff most of whom received part of their training in overseas institutions.

In general the graduates were industry ready. In the past few decades, however, the quality of the Nigerian geoscience graduates has fallen abysmally and most, on graduation cannot perform the basic function of a geologist which is to prepare a geological map and draw an appropriate cross-section. The industry has protested this situation and has devised various options to circumvent it so that the business it is involved in can continue to run profitably e.g. Shell introduced Re SITP scheme in Warri which is now replaced by the Centre of Excellence Project located at the University of Benin. Total E&P partnered with the University of Port Harcourt to set up the Institute of Petroleum Studies (IPS). PTDF began a 12 month Overseas Scholarship



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Scheme (OSS) for the award of a Masters degree in order to address the charge of the industry that Nigerian graduates are not employable.

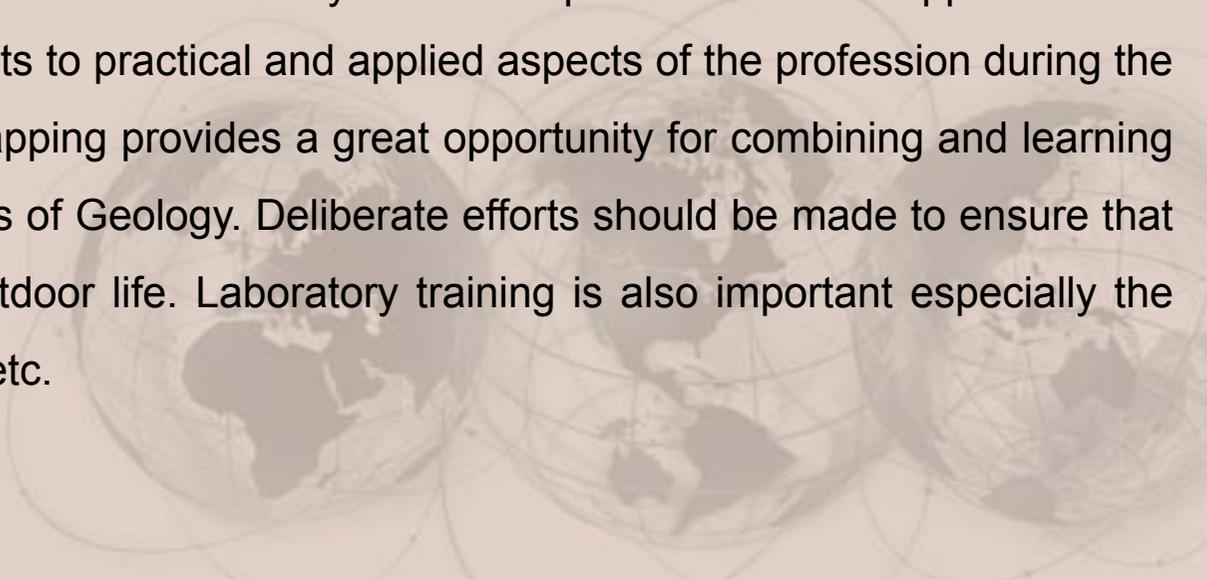
Companies go overseas to recruit Nigerian graduates trained in overseas institutions in order to fulfill the demand of the Federal Government that a certain percentage of Nigerians must be employed into some positions. What then is the fate of the Nigerian trained graduate? The intervention, University – Partnership, and Train the Trainer initiative of Ehimade Nigeria Ltd under the able leadership of Dr. Daniel Lambert – Aikhionbare in conjunction with Esso and some indigenous oil companies such as Amni, Afren, Niger Delta EXP. is laudable.

A significant proportion of the Higher Institutions of learning where geoscientists are trained have instituted postgraduate programs for various reasons, one of which is to provide remedies for the deficiencies of the undergraduate programs. This approach suffers from the same defects of the undergraduate programs. Emphasis is placed in most of these institutions on the pure and fundamental aspects of the profession rather than the applied aspects. The justification for this approach is that no matter how much training is given in the applied aspects it will not yield



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competent geoscientists unless that training is based on a good understanding of the basic principles which constitute the foundation of all geoscientific education. The needs of our country as we are informed by the end users of the products of our institutions tell us that applied geology is relevant and should not be secondary to fundamental / pure geology. There is therefore a need to find a balance between both approaches. Alternatively, the two desirable components could be separated. Theoretical and fundamental principles are emphasized in the formal training and the applied/practical aspects are introduced at a later stage during e.g. a skill-based professional master program such as the 12 month intensive professional master programs introduced at the Department of Geology, Obafemi Awolowo University Ile-Ife in April 2012. A third approach is to find a way of introducing the students to practical and applied aspects of the profession during the early formal training. Geological mapping provides a great opportunity for combining and learning both theoretical and applied aspects of Geology. Deliberate efforts should be made to ensure that students love fieldwork and the outdoor life. Laboratory training is also important especially the use of microscopes, stereoscopes etc.





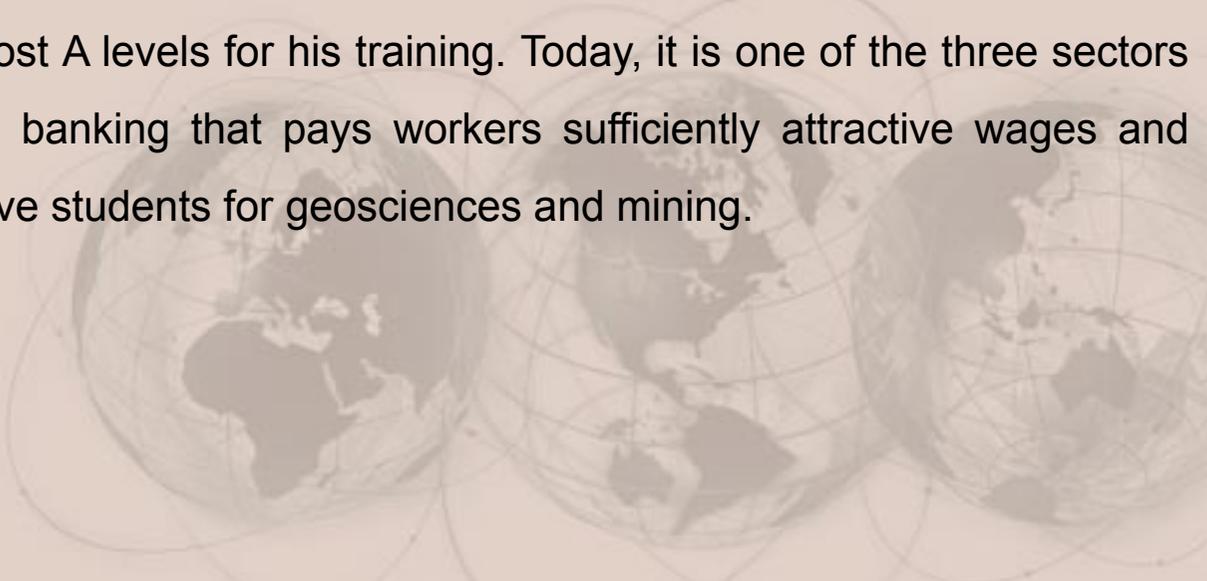
PREAMBLE

Proper fundamental training cannot be conducted without fieldwork which brings geology closer to the students. At present most Departments in Nigeria do not have the field vehicles, compasses, hammers, lenses and other necessary items of equipment to conduct fieldwork, the immediate result of these inadequacies is that fieldwork is drastically reduced in some cases deleted from the training program which then becomes essentially theoretical. How many students possess adequate fieldboots, rucksacks, GPS, for fieldwork? How many students would rather be in the field studying rocks than be in front of a workstation in the Department? Companies which are not yet partnering with Ehimade Nigeria Ltd. in its intervention program are urged to please do so. Some departments now ask the students to provide the funds for the conduct of aspects of the fieldwork programs such as vehicle hire and fuelling, payment of the allowances of the drivers, accommodation and feeding in the field. This is an additional burden on the financial sponsors of the students. It is my hope that the list of items paid for by students will NOT grow one day to include allowances of the instructors (lecturers, technicians etc.) I do not think the students should pay for the allowances of the drivers. If the present trend continues, the time will come when only the children and wards of the rich and comfortable will be financially qualified to study geology. The level of funding of Geology and Mining Engineering Departments has to be substantially increased to meet their needs to train competent geoscientists.



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The Nigerian economy at present is dominated by the output of geoscientists and mining engineers. The mining subsector comprises crude petroleum, gas and solid minerals. The largest mining activity is production of crude oil. It accounts for about 15% of the GDP and for about 90% of foreign exchange earnings while non-oil exports accounts for the balance. Earnings from this subsector alone accounts for between 70-80% of the resource of the three tiers of government in Nigeria, but the petroleum industry contributes little to graduate employment. The colonial and subsequent Governments recognize the importance of the sector to our national well-being, hence a geoscience graduate after 3 years post A-level training on being employed earned more than a medical doctor who spent 5 years post A levels for his training. Today, it is one of the three sectors along with telecommunications and banking that pays workers sufficiently attractive wages and hence the large number of prospective students for geosciences and mining.





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Our responsibility as a regulatory body is therefore enormous, the nation depends on us to ensure the growth of her wealth and safeguard the welfare and well-being of the citizenry. The level of funding of Geology and Mining engineering Departments should be substantially increased to reflect the importance of the graduates of these Departments, when they are gainfully employed, to the economy of the country. Government and other funding agencies must recognize this and correspondingly provide special funding of these institutions.

Geoscientists contribute to development in virtually all aspects of life and among the most important areas are the following; water, energy, metallic, non-metallic minerals geotechnics, environment and academia.



ACCREDITATION EXERCISE

- The standards describe the deliverables (the learning outcomes) of the programmes, They should allow for considerable variation in the emphasis of individual programmes. A department located where water resources development is crucial to the needs of the country may wish to place considerable emphasis on hydrogeology & hydrology. Other areas, of course, will be taught up to and above the minimum standard set for each course. A Department that obtains minimum scores in all areas will not be accredited since the deficiencies where minimum scores were obtained should have been made up in other areas where the Department ably demonstrates higher capabilities.

ACCREDITATION EXERCISE

Deliverables

The deliverables or learning outcomes describe what the graduate is expected to know, understand and/or able to demonstrate at the completion of his/her studies. They are the quality standard for competencies, skills and knowledge. They form the training base for practicing the profession or for further postgraduate studies.

With this foregoing background, we can at this stage ask the important question. **What is the objective of our accreditation exercise?**

Is it to ensure that anyone who takes a degree from our accredited programs can function as a professional or is it just to qualify the graduate for further education, training and/or industrial exposure?

ACCREDITATION EXERCISE

Deliverables contd.

Accreditation of a program should be the primary result of a process used to determine the suitability of that programme as providing the education base for the entry route to professional practice. It would involve periodic assessment (every 4 years) against accepted standards of geoscience and mining and also assess the in-built features of the Degree program for continuous improvement of its quality.

It is the responsibility of COMEG, with the assistance of all of us the stakeholders, through its accreditation exercise to decide whether the content and execution of a program in Geology and Mining Engineering are sufficient for professional practice in Nigeria.

Graduates of an accredited program would be expected to have achieved the appropriate standards for competencies, skills and knowledge as the education base for practicing their profession or for post graduate studies. The breadth of the courses offered, the focus on technology and skills and the opportunity for inter disciplinary training, group and teamwork and the preparations of students by the nature of mining and geology especially through fieldwork to make

ACCREDITATION EXERCISE

Deliverables contd.

momentous decisions based on incomplete evidence should be captured in the programs. In order to achieve this, we adopt the following four categories of the learning outcome;

- Underlying basis for Geology and Mining Engineering:
This identifies the capabilities that are essential to satisfy the other learning outcomes. It defines the knowledge and skills the geology graduate should possess.
- Analysis Design and Implementation: describes the basic steps of a work cycle:
- Technological, Methodological and Transferable Skills:
is the expected ability of the graduate to combine and extract his/her technical skills and knowledge to solve problems. In this way, he/she can use appropriate methods and materials to achieve a specific objective..

ACCREDITATION EXERCISE

Deliverables contd.

Other Professional Competencies: are soft skills such as ability to communicate information, ideas, problems and solutions, project management and the principles that govern the working environment .

For each of the four categories expected programme learning outcomes have been formulated.

The immediate consequence of this is that each department will be required to produce the aims and learning outcomes for each year of the program being offered. These, I expect will vary in detail from institution to institution since as was indicated earlier emphasis on aspects of the discipline may differ as determined by e.g. geographical location.



ACCREDITATION EXERCISE

Deliverables contd.

The programmes must introduce students to the major aspects of geology and ensure that they attain appropriate level of skill in highlighted areas such as field mapping, drawing of cross-section as aid to 3D visualization, petrography, report writing. How many days of field work is appropriate for a 4-year Geology/Mining Engineering programme?

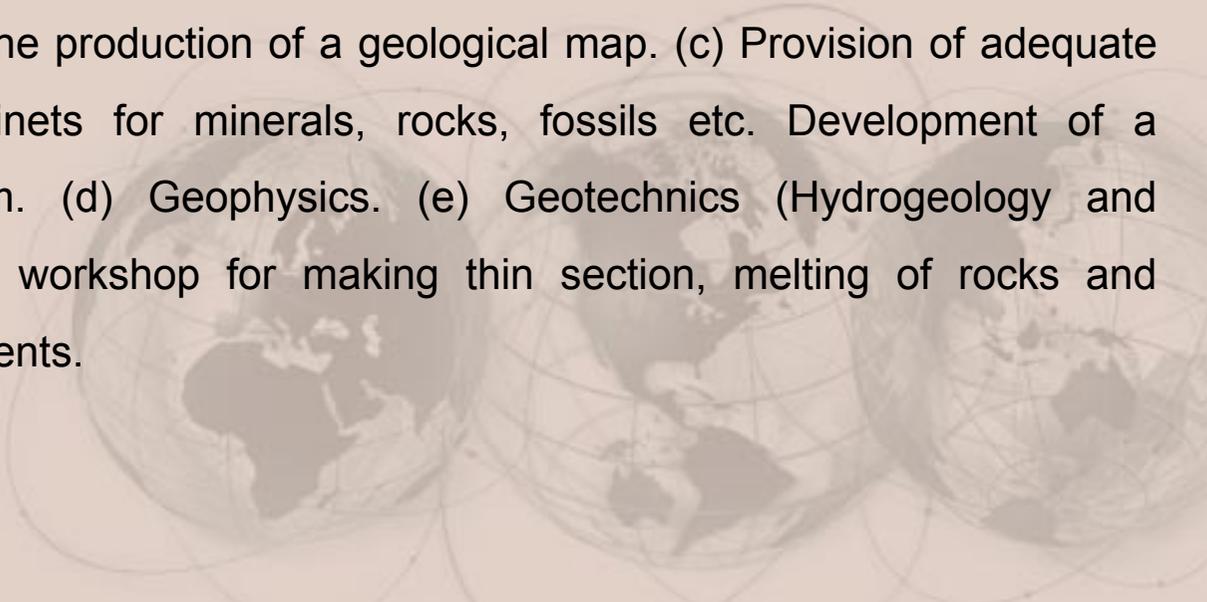
The courses must be taught by appropriately qualified staff with relevant postgraduate research and/or professional experience and, quite importantly those who demonstrate evidence of continuing professional development e.g. Do these lecturers attend conferences, and if they do, do they present papers?

The course content should contain sufficient contributions from the cognate sciences, mathematics, chemistry, physics and biology to aid the understanding of time and scale, space processes and techniques in geosciences. It should also pay close attention to the contribution of geosciences to the environmental, economic and cultural needs of society which tended to be ignored in the past.



ACCREDITATION EXERCISE

GUIDELINES FOR THE CRITERIA AND REQUIREMENTS OF PROGRAMME ASSESSMENT

1. Relevant information on the Department offering the programme to include; (a) educational objectives of the Department that are consistent with the mission and vision of the Department, the areas of specialization/emphasis, learning outcomes Full Accreditation by NUC/NBTE.
 2. A curriculum and related processes e.g. (a) Not more than 50 students per year. (b) A minimum of 80 days of fieldwork in a 4 years program to include at least 30 days of independent mapping for the production of a geological map. (c) Provision of adequate shelves and display cabinets for minerals, rocks, fossils etc. Development of a geological/mining museum. (d) Geophysics. (e) Geotechnics (Hydrogeology and Engineering Geology). (f) workshop for making thin section, melting of rocks and fabrication of small implements.
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ACCREDITATION EXERCISE

GUIDELINES FOR THE CRITERIA AND REQUIREMENTS OF PROGRAMME ASSESSMENT

3. Appropriate Resources to include at least 5 laboratory; (a). mineralogy and petrography. (b). Paleontology and Sedimentology and (C). Geochemistry. and Partnerships – academic, technical and administrative support staff, facilities, equipment, financial resources, cooperation agreement with industry, other departments, government etc.
4. Adequate Assessment of the Educational System. Are external examiners being used to vet examination question and to interview/ interact with potential graduates? Are Departments involved in the admission process? The Department should provide statistics on its graduate employment and if possible obtain from employers feedbacks on their ratings as employees.
5. An Effective Quality Management System. That is one which ensures the systematic achievement of the learning outcomes and continual improvement of the program. Production of Departmental annual reports.

ACCREDITATION EXERCISE

GUIDELINES FOR THE EVALUATION OF INDIVIDUAL REQUIREMENTS

A scale with the following 3 categories is suggested:

- Acceptable without reservation
- Acceptable with adjustment requirements
- Unacceptable

We can read this to corresponding to full accreditation, interim accreditation and denied accreditation.

Acceptable means requirements have been fully met even if improvements are still possible.

Acceptable with adjustment requirements means requirements have not been fully met, but are judged to be achievable within two years given that acceptable without reservation accreditation is valid for only 4 years.

Unacceptable means the requirements have not been met or fully met and cannot be met within the period of 2 years.

ACCREDITATION EXERCISE

GUIDELINES FOR PROGRAMME ACCREDITATION

- A. Application by a Department for Accreditation
 - A department having obtained NUC/NBTE Full Accreditation status applies to COMEG for Accreditation. Upon receipt of the application, COMEG will forward a self-assessment questionnaire to the Department.
- B. The Department is given a period of 2-3 months to complete and return a copy of the self assessment report to COMEG
- C. COMEG composes an Auditing Team. The team should be made up of 3 or 5 persons. If 3 then 2 Academics and 1 practitioner who preferably should have a higher degree. If 5 then 3 academics and 2 practitioners who should have higher degrees. A chairman/chairperson is appointed by COMEG for each auditing team. The team will receive a – one day briefing from COMEG before setting out on the assignment

ACCREDITATION EXERCISE

GUIDELINES FOR PROGRAMME ACCREDITATION CONTD.

- D. Each member of the auditing team must provide a written statement that no conflict of interest exists between him/her and the Department to be accredited before the commencement of the exercise.
- E. The assessment exercise should last at least 3 days to provide ample time for verification of the claims in the self assessment report and interaction with staff, students and officials of the University.
- F. The team at the end of the exercise submits a detailed report to COMEG complete with appropriate recommendations as to the accreditation status of the Department.
- G. COMEG based on the report from the Auditing team takes the final decision as the accreditation status of the Department and communicates its decision to the University/Polytechnic.
- H. Any department/institution that disagrees with the decision of COMEG on its accreditation status may appeal to COMEG for a reassessment giving valid reasons why a reassessment is sought e.g. Unfair assessment by a member of the auditing team (see (d) above).

ACCREDITATION EXERCISE

ETHICAL ISSUES AND SANCTIONS

Auditing team and COMEG to have zero tolerance for unethical behaviour. Any perceived unethical behaviour should be reported by the Auditing Team and investigated by COMEG and if proven, sanctioned.

All Departments offering relevant programmes in Geosciences and Mining Engineering must seek COMEG Accreditation. COMEG will not be able to register the graduates of those Departments that have not been accredited by COMEG which means that such graduates cannot legally/legitimately be offered employment.

- Falsification of entry in the self-assessment report. This will attract a denial of accreditation for a specific period of time (1 year, 2 years?)
- A COMEG registered individual who is falsely presented as a member of staff of a Department for the purpose of accreditation exercise. COMEG will view this as a gross misdemeanor which could attract striking the name of such an individual off the list of registered practitioners.



Thank you for your attention

