

# EDUCATION AND TRAINING OF STRUCTURAL ENGINEERS AT A TIME OF GLOBAL ECONOMIC MELTDOWN

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## Abstract

The paper reviews the journey so far for Structural Engineering as a programme in the University of Benin, how it started, and the challenges it faced so far. The paper also reviews the efforts of the Nigerian Institute of Structural Engineers (NIStructE) towards tackling these problems and how the demands of the Academic Staff Union of Universities (ASUU) if met, would alleviate the problems. The paper further discusses how the Global Economic Meltdown has affected the programme in the area of funding, lack of suitable industry-based companies for students' industrial attachment, brain drain, loss of qualified and experienced lecturers to other countries, and lack of adequate jobs for young graduates of Structural Engineering. It pin-points that the University of Benin is the only higher institution in the country that runs Structural Engineering as a programme and the need to run the programme in other Universities. It further suggests the way forward for the education and training of Structural Engineers at a time of Global Economic Meltdown and that Government, as a matter of urgency, should provide sufficient funds for the effective and efficient running of the higher institutions in the country.

## Introduction

Education is a powerful instrument designed by man for his improvement. It prepares people for work and life (Nwagwu, 1976). Fafunwa (1982) sees African education to be multilateral with the primary aim of producing individuals that are honest, responsible, skilled, cooperative and self reliant. In Nigeria, there was a steady growth in the per capita real government educational expenditure from 1970 to 1976 after which a continual decline set in to date. The trend after 1976 is a cyclic decline showing under-development or falling levels of educational standards in both quantity and quality. The negative impacts on education, according to a report by the Federal Ministry of Education (2000) particularly in the area of funding are:

- i. The establishment of many tertiary institutions, including Polytechnics, Colleges of Education and Universities, most of which could not be adequately funded resulting in a sharp fall in standard.
- ii. The crises in the educational sector resulting from non-payment of teachers' salaries, strikes, students anti-social behaviours e.g. cultism, irregular school calendar and overall decline in the provision of human and material resources for education; and
- iii. The deterioration and dilapidation of infrastructural facilities in the school systems.

This implies that government still remains the major source of funding for all the tertiary institutions in Nigeria. So any factor, whether economic crisis or militants' activities, that affects government's revenue also affects the educational system. One of such factors is the Global Economic Meltdown.

The global financial crisis, brewing for a while, really started to show its effects on Nigeria in the middle of 2007 and all through 2008 and has continued unabated (Kalu, 2009). The crisis started in the United States due to certain laxities in the United States financial and regulatory system, spread to Europe, and has become global. Even countries not affected by the financial crisis are now affected by 'second-round effects' as the crisis now becomes more fundamentally "economic".

Some Nigerians were even of the opinion that as a nation, Nigeria would not be seriously affected by the meltdown. According to some, Nigeria was not likely to get caught in the economic backlash. The reason being that Nigeria, unlike other nations, had no significant foreign ownership in the United States except its foreign reserve that was lodged in United States and European banks, which stood at a fluctuating rate of \$59 billion as at 2008.

Even though as at then, the World Bank had pointed out that there could be a “cut-back” in foreign capital inflows into the African region, which could cause an impact. It further went on to point out that Nigeria’s current Aid assistance from foreign donors as at 2008 stood at about one per cent of her entire budget. Since this was such a small percentage, the cutback should not really have a long-term impact on the capital inflow.

The former governor of the Central Bank of Nigeria (CBN) had in 2008, stated that the Nigerian banks were very healthy, declaring fantastic profits and dividends to their shareholders. The capital adequacy of the banks at 22% was very comfortable compared to 10% globally and with the liquidity ratio reduced to 30% from 40% in August 2008, substantial funds put at about N1.7 trillion had been freed for use by the banks, which had substantially improved the liquidity of the banks.

In addition to this, the CBN opened an alternative discount window to banks and discount houses to access funds and shore up their liquidities. In performing its role as a lender of last resort, banks and discount houses could borrow funds for 360 days as against overnight accommodation which was previously provided.

Apart from these assurances and measures, there were still fears that Nigeria could also be caught up in the global economic mess. According to Adesina (2008), politically and economically, no nation, these days, is an island. The dramatic reduction in the price of oil by more than 50% cannot but have a significant effect on the revenues and expenditure of the government since government remains the largest spender of money in Nigeria and the oil sector in Nigeria contributes about 99% of exports and provides about 85% of government’s revenues (Adesina, 2008).

With the marked fall in the prices of oil from about \$140 per barrel to about \$54 per barrel in 2008, the Federal Government had started to warn people to prepare for tight fiscal measures in 2009. Thus, Nigeria’s economy, as many believed would not be seriously affected by the global economic crisis, could not after all be immune from the global meltdown as the fall in the prices of crude oil had begun to impact on the revenues of the government.

Now as the Universities, both State and Federal are funded by the Government and as the government’s finances are being affected by drastic fall in oil prices due to the melt down, the release of funds for needs of academic programmes in Nigerian Universities will also be affected. This paper, therefore, intends to look at how the Global Economic Meltdown has influenced the level of government’s spending on education relating it to the funding of Structural Engineering programmes in our tertiary institutions in the country.

### **The Journey so far of Structural Engineering at the University of Benin**

Incessant collapse of constructed goods and lack of local capacity to implement the nation’s construction objectives were the primary reasons why the Nigerian Institution of Structural Engineers (NIStructE) and the National Universities Commission (NUC) solicited the cooperation of Nigerian Universities to help run a programme in Structural Engineering (Alutu, 2006).

Structural Engineering as a programme took off in 1997 with 5 students admitted through direct entry. By the end of 2005/2006 over 80 graduates had been produced with B. Eng. Degrees in Structural Engineering. The programme was sustained until 2005/2006 session when the Faculty of Engineering sought senate’s approval to scrap Structural Engineering programme. The reasons given were that the Council for the Regulation of Engineering (COREN), during its accreditation visitation of Civil Engineering programme of 12<sup>th</sup>-16<sup>th</sup> September 2004, recommended the scraping of the Structural Engineering programme and merging it with Civil Engineering programme. The reasons why COREN recommended that the programme be scraped were that the funding of the programme was poor, the staff-students ratio fell short of the minimum standard and that the equipment for the programme was inadequate. However, due to the intervention of some members of the senate who knew the importance of producing Structural Engineers for the nation, the programme instead of being scraped was “simply suspended” in 2006. The students in lower levels of 100, 200 and 300, were automatically and laterally transferred to Civil Engineering while those in 400 and 500 levels were given the option of either to remain in the programme or to transfer to Civil Engineering.

A later visit by NUC accreditation committee to the Department between 13<sup>th</sup> and 15<sup>th</sup> November, 2005, recommended that the programme be denied accreditation. This implied that there was not going to be any more new intakes or admissions into the programme until it is accredited.

**Efforts made by the Nigerian Institute of Structural Engineers (NIStructE) towards the Reviving of Structural Engineering Programme in the University of Benin**

At the wake of all these problems, NIStructE in its bid to train qualified Structural Engineers in Nigeria resolved to revive the Structural Engineering programme of the University of Benin that had denied full accreditation status in the NUC and COREN accreditation exercises in 2005.

In 2006, the then President of NIStructE, in a bid to revive Structural Engineering programme in the University of Benin paid a courtesy visit to the Executive Secretary, NUC. While speaking during the visit, he attributed the perennial collapse of building in various parts of the country to inadequate qualified personnel to supervise structural projects. He argued that the claim by Civil Engineers, Mechanical Engineers and Builders to be Structural Engineers was dangerous for the nation.

He revealed that the major problem hindering the running of the programme at the University of Benin was lack of facilities. The facilities required, according to him, have been listed and the fund for remedying the deficiencies of the programme was being sourced.

He informed the Executive Secretary that the institution would be meeting with other stakeholders like COREN, Nigerian Society of Engineers (NSE), Education Trust Fund (ETF) and the Senate and House Committees on Education for a once and for all solution to the problem. He added that because of the problem, the annual conference of the institution in 2006 would take place in Benin.

NIStructE had noted that the Structural Engineering programme at the University of Benin had no separate budget for itself. Both Structural Engineering and Civil Engineering were run from budget meant for Civil Engineering. The institution, through interactions with both the University of Benin and the NUC, were able to initiate a separate budget for the programme for it to function effectively.

With the advent of all these, there appeared to be some light at the end of the tunnel for the Structural Engineering programme at the University of Benin. Then by January 2007, senate directed the Dean of the Faculty of Engineering to lift the suspension placed on the Structural Engineering programme and instructed that 100, 200 and 300 level students of the programme who were absorbed into the Civil Engineering programme that were willing to relocate to Structural Engineering should be allowed to do so. Moreover, the NUC accreditation visit to the department in October 2008 granted interim accreditation to the Structural Engineering programme, to the extent that fresh students are billed to be admitted into the Structural Engineering programme by March 2010 at the 100 level. Thus, there is hope that Structural Engineering programme at the University of Benin, Benin City has come to stay.

**Efforts made by the Academic Staff Union of Universities (ASUU) towards the Improvement of the Educational System in Nigeria**

The Academic Staff Union of Universities (ASUU) has noted four major areas requiring attention which need to be urgently addressed and rectified. These are:

- Reversal of decay in the University system, in order to reposition it for greater responsibilities in national development;
- Reversal of the brain drain, not only by enhancing the remuneration of academic staff, but also by disengaging them from the encumbrances of a unified civil service wage structure;
- Restoration of Nigerian Universities, through immediate, massive and sustained financial intervention, and
- Fostering genuine university autonomy and academic freedom.

However, the areas of immediate concern were narrowed down to four namely: conditions of service, funding, university autonomy and academic freedom.

**Conditions of Service**

There is the need for a separate Salary Structure for University Academic staff in the Universities. This is because Nigerian University academics represent the critical mass of scholars in the society, with the potential of transforming it. They therefore deserve unique conditions of service that would motivate them like the intellectuals in other parts of the world, to attain greater efficiency

and effectiveness in service, and thereby stem the brain drain. This is necessary as many of our academic brains move to other African countries such as South Africa, Ghana, Botswana, as well as to developed countries that offer better conditions of service. For example, Civil Engineering Department between 2005 and 2007 has lost three members of academic staff to the British Special Skill Programme. These people go to these other countries for greener pastures.

### **Funding**

The so much talked about vision 20, 2020, means that in the year 2020, Nigeria would be among the 20 leading economies in the world. This is just about 10 years from now and where we are now shows no sign that we will get there even in the next 30-40 years to come. If Nigeria is to become a leading economy in the world within the next ten years or so as desired by the Government, then the task of revitalizing and accelerating the development of the Nigerian University system to become internationally competitive can no longer be delayed. ASUU is aware of this, and have demanded the following funding requirements for a quick and effective remedy of deficiencies in the programmes and facilities, and for a systematic upgrading of programmes and facilities that would rapidly advance Nigeria's knowledge production for development.

These funding requirements are:

- All regular Federal Universities shall require the sum of 1.52 trillion naira for academic programmes in our universities for the period 2009-2011; and
- Each State University shall require 3.68 million naira per student for the same period 2009-2011.

The major source of fund was to come through budgetary allocation from State and Federal Governments. A minimum of 26% of the annual budget of the State and Federal Governments was demanded to be allocated to Education. Other sources of funds were to be from the Education Tax Fund (ETF), Petroleum Technology Development Fund (PTDF), contributions from the private sector, contributions from Alumni Associations, etc. All these are still at the proposal stage. They are yet to be implemented.

### **The Effects of the Global Economic Meltdown on the Education and Training of Structural Engineers**

#### **Funding**

For Structural Engineering to run effectively as a programme, adequate funding must be provided. One of the factors that led to the scraping of Structural Engineering programme at the University of Benin was that of inadequate funding. Funds are needed for the purchasing of modern equipments and facilities needed for the education and training of Structural Engineers as the ones on ground are now outdated and in a state of dilapidation. This problem was what ASUU was trying to address generally. After a draft agreement had been reached by the negotiation team of the Federal Government and that of ASUU in 2007, the Federal Government declined to sign the agreement in 2009 because of the Global Economic Meltdown that had affected her seriously.

The Global Economic Meltdown, which began in the United States, has crept gradually into Nigeria. Nigeria was affected primarily because her major source of revenue is through the exportation of crude oil. There was a dramatic reduction in the price of crude oil as cited earlier on, by more than 50% and crude oil in Nigeria currently contributes 99% of exports and provides about 85% of Government's revenues.

There was marked fall in the prices of oil from about \$140 per barrel to about \$54 per barrel coupled with the fact that the United States, which was the largest buyer of our crude oil, reduced the quantity they purchased during this period of recession. The activities of militants in the Niger Delta region also had a negative influence on oil production. So, a fall in the price of crude oil, coupled with reduced sales and militants' activities, the Federal Government had started to warn people to prepare for tight fiscal measures.

According to the Federal Government, the effect of the Global Economic Meltdown on the Nigerian economy was responsible for Government's inability to meet up with the full demands of the 2007 draft agreement with ASUU. This led to strike action embarked upon by ASUU that made our higher institutions desolate for a period of 3 months. This action by ASUU worsened the whole

situation as there was now anomaly in the educational calendar of all the higher institutions in the country making all students lose 3 months in their academic calendar.

### **Reduction in the Number of Qualified and Experienced Lecturers**

The number of qualified and experienced lecturers in our higher institutions is decreasing rapidly as against the increasing number of higher institutions in the country. This is due to the massive brain drain that is occurring whereby our academicians are leaving the country to other countries in search for greener pastures. The only way to reduce this is to improve on the conditions of service offered to academicians.

However, due to the effect of the Global Economic Meltdown on the Government's revenue, government has not been able to improve on the conditions of service for academicians in such a way that it will be attractive.

### **Lack of Commitment on the part of Educators/ Lecturers**

Due to the poor condition of service and the global economic meltdown that has affected the economy at large; many lecturers now engage in private businesses to make ends meet. Some of them even take up to 2, 3 or more jobs. This has affected the training and education of Structural Engineers as the students are, most of the time, left to cater for themselves.

### **Students Placement for Industrial Attachments**

The NUC's minimum standards for Engineering and Technology education contained in the Decree No. 16 of 1985 as incorporated in the amended Decree No. 49 of 1988, required the Universities to produce graduates with high academic standards and with practical background that is of immediate value to the industry and the nation. Alutu (2003) has also stressed the importance of Industrial Attachment in the education and training of Structural Engineers. Industrial attachment is contained in the 5-year training of Structural Engineers. It is equivalent to a minimum duration of 40 weeks (one semester and 3 long vacations) in the 5-year Engineering programme in all Universities. This period is spent gaining experience in the industry.

However, as a result of the Global Economic Meltdown, several industry-based companies had cut down their workforce. Thus, it became difficult for students to obtain suitable industry-based companies for their industrial attachment.

### **Reduction in the Number of Available Engineering Jobs:**

During the recession caused by the meltdown, many Engineering companies had to lay off most of their workforce in a bid to survive the tough financial squeeze. Many Structural and Civil Engineers were rendered jobless. It was even worse for those who had just rounded up the National Youth Service Corps (NYSC) as they could not get the relevant engineering jobs that would enhance their training to become renowned Structural Engineers, to the extent that over 50% of the trained Structural Engineers now work in the banking industry. However, a few of the Engineers that manage to get employed in the Engineering Industry receive peanut for pay.

### **The Way Forward**

Having seen all these challenges posed on the education and training of Structural Engineers at a time of Global Economic Meltdown, one will begin to ask for the way forward. If eventually, we do not come out of this crisis, does it mean that Structural Engineering will die out of our higher institutions? It will, if we do not take necessary steps, hence the way forward:

- Since the major source of funding to the Universities comes from the budgetary allocations from State and Federal Government, in order to rectify most of the deficiencies in our Universities in the nick of time, a minimum of 26% of State and Federal budgets should be allocated to the education sector as stipulated by the United Nations (UNDP, 2004).
- In addition to Government funding, other sources of funding should be made mandatory e.g. Education Tax Fund (ETF), Petroleum Technology Development Fund (PTDF), contributions from NIStructE especially for Structural Engineering programmes, contributions from Alumni Associations of Universities, and also from private sector organisations.

- It should be made mandatory for Construction companies and other Industry – based companies to sponsor research programmes in our Engineering laboratories as is being practised in other developed countries. For instance, as the cost of construction materials, like cement, has gone up as a result of the global financial crisis, researches can be carried out to sort for other materials that can be used to replace cement so as to reduce the cost of construction.
- Since there is a shortage of capable and experienced hands in the Universities, NIStructE can send some of her experienced and qualified personnel (especially those that have vast practical experience) to the Universities to render help in some of the taught structural engineering courses.
- Industry – based companies should be mandated to accept and train students on industrial attachment.
- NUC, NIStructE, COREN and the Industrial Training Fund (ITF); should draw out a workable programme for the industry – based companies that will see to the effective training of students on industrial attachment and young graduates of Structural Engineering.

### **Conclusion**

From the foregoing, conclusions can be drawn:

- The Global Economic Meltdown has actually affected our educational system that is supposed to educate and train Structural Engineers for the future. This is because the meltdown has led to the reduction of oil prices by up to 300%, which in turn has reduced government's revenue, 85% of which is derived from oil sales.
- Since the major source of funding to the Universities comes from the budgetary allocations from State and Federal Government, a drastic reduction in government's revenue will drastically reduce funding to the Universities.
- If most of the deficiencies in our Universities should be rectified in the nick of time, then it becomes imperative that a minimum of 26% of State and Federal budgets should be allocated to the education sector.
- In addition to Government funding, other sources of funding should be made mandatory e.g. Education Tax Fund (ETF), Petroleum Technology Development Fund (PTDF), contributions from NIStructE especially for Structural Engineering programmes, contributions from Alumni Associations of Universities, and also from private sector organisations.
- Construction companies and industry – based companies should be mandated to sponsor research programmes in our Engineering schools.
- Industry – based companies should also be mandated to accept and train students on industrial attachment as well as young graduates of Structural Engineering under the supervision of NIStructE, ITF and other stakeholders.
- Visiting lecturers from NIStructE should be encouraged to lecture some of the taught courses in the Structural Engineering programme.
- Lastly, it should be made known to Government that if Nigeria hopes to achieve her vision 20, 2020, the need for our higher institutions to be properly developed and funded cannot be compromised.

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