RELEVANCE OF RESEARCHES IN PHYSICAL SCIENCE FOR NATIONAL DEVELOPMENT

Muntari Abubakar

Basic and Applied Science College of Science and Technology
Hassan Usman Katsina Polytechnic

Katsina

E-mail: Muntariabubakar@ymail.com

Abstract
Research is carefully planned and performed investigation, searching for previously unknown facts. It’s the bedrock of all national developments. This paper explain the role of research in physical sciences in national building arguing that Nigeria is blessed with human and natural resources’ which if properly utilized will make her one of the developed countries. But one of the most problems is that there is no encouragement due to lack of funding from government. This paper recommended the government should give adequate funds to the research institutions so that they will concentrate on applied researches.

Keywords: Research, Physical science, Development and Building.

Introduction
Research is a carefully planned and performed investigation, searching for previously unknown facts. The search for knowledge or as any systematic investigation, with an open mind to established novel facts using a scientific method (wikipedia, 2010).

Also research is simply the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis and interpretation of data. Research is a most important tool for advancing knowledge, for promoting progress and for enabling man to relate more effectively to his environment, to accomplish his purposes, and to resolve his conflicts (Sunday, 2010).

There are many researches in different fields of study, one of which is Physical Science. Physical Science is an encompassing term for branches of natural science and science that study non-living systems in contrast to biological science. It is any science, such as Physics, Chemistry, Astronomy and Geology that analyze the nature and properties of energy and non-living matter (wikipedia, 2010) (Webster, 2010).

On the other hand, National development can be viewed as a process of social and economic transformation within nations that is accompanied by economic growth and social justice and political freedom. The aim of this paper is to examine how researches in Physical Science in general and Physics in particular can be relevant to national development.

Physical science, types of research and scientific method
Physical science has earlier been defined as an encompassing term for the branches of natural science and science that study non-living systems, in contrast to the life science. However, the term “physical” creates an unintended, somewhat arbitrary distinction, since many branches of physical science also study biological phenomena (wikipedia, 2010).

This paper will concentrate on researches in Physics. Since Physics is the “fundamental science” because the other natural science or physical sciences (Biology, Chemistry, Geology, e.t.c.) deal with systems that obey the laws of Physics. The physical laws of matter, energy, and the forces of nature govern the interactions between particles (such as molecules, atoms or subatomic particles) (wikipedia, 2010).

Types of research
Research is defined as the quest for new scientific or engineering knowledge. It is the heart of any national development. The concept of research is as old as science. The innovations that result in new product and new processes usually have their roots in research. Indeed, an innovation might be defined as the application of an invention to a significant desired need (Gumel, 2008).
Research can be broken down in the following components (Ikuforiji, 2009).

a. Basic Research: This is called pure or fundamental research. It is the original investigation undertaken in order to gain new scientific knowledge and understanding. It is not usually directed towards any scientific aim or application and is directed towards the investigation of newly discovered frontiers of technology.

b. Applied Research: Also called industrial research, it is concerned with the production of knowledge for practical use of human beings. It uses the findings of basic research to solve an identified practical problem. By its nature, applied research produces results, which can be used right. Where there is applied research, there is subsequently development.

c. Adaptive Research: This is defined as the use of scientific knowledge to modify or generate new products, processes or technology from another one (usually the imported one). The objective is usually to adopt the local factor endowments of the importing country and to improve on the resulting product. This type of research has gained a lot of prominence in recent time (Ikuforiji, 2009).

Scientific method

Scientific method is a term denoting the principles that guide scientific research and experimentation, and also the philosophic bases of those principles. Scientists use the scientific method to test the validity of a physical theory, using a methodical approach to compare the implications of the theory in question with the associated conclusions drawn from experiments and observations conducted to test it. Experiments and observations are to be collected and matched with the predictions and hypotheses made by a theory thus aiding in the determination or the validity/invalidity of the theory (wikipedia, 2010). Scientific method involves the following steps (Gumel, 2008).

(i) Identifying the problem
(ii) Doing research
(iii) Stating a hypothesis
(iv) Conducting project experimentation, and
(v) Reaching a conclusion

Contemporary research in physics can be broadly divided into Condensed matter Physics; atomic, molecular, and optical Physics; Particle Physics; Astrophysics; Geophysics and Biophysics (wikipedia, 2010).

Researches in physical science

The following researches were made by local scientists and engineers:

A two-digit objective counter: It is used in manufacturing industries to count manufactured products. It is used to count moving objects on the conveyor belts. The counting is achieved when an object on the conveyor belt interrupts the emitted rays from the infrared LED (Light Emitting Diode), the signal is converted to electrical pulses by the accompanying circuits. The pulses generated are used to trigger the counting registers and the result is displayed simultaneously (COHEADS, 2002).

Hospital call system: It is an equipment that can be used to call the attention of a doctor to a patient that requires urgent attention, through the use of lighting signals, indicator lamps coupled to a suitable loudspeaker. It can be installed by the bedside of the patient in hospital to enable the patient himself or herself call the attention of doctors in case of emergency. (COHEADS, 2002).

Oil/juice extracting machine: It is a medium-sized machine designed for extracting oil/juice from various seeds/fruits. It uses a hydraulic press for the extraction. Loading fruits/seeds, collection and discharge of filtrates and residues are simply achieved with the machine (COHEADS, 2002).

Shoe shining device: It is electrically operated device, used for shining shoes. Rotational motion of electric motor is converted to reciprocating motion of the brush holder (COHEADS, 2002).

Simple centrifuge machine: It is used for the following:
- Separating suspended particles from liquid
- Separating heavier blood cells from blood plasma
- Urine analysis Liver / Ascetic fluid analysis. E.t.c. (COHEADS, 2002)

Automatic electronic egg candler: It is build to scan Eggs in identify which of the eggs is still in a good or bad state traditionally eggs are examined for viability by holding the egg with the palm closed and then viewing the content through the rays of sun or light. If the egg contains any trace of blood, the egg is said to be viable. This traditional method cannot be used to identify and edible or fresh egg especially when the egg has stayed over weeks. But the automatic egg Candler can. The machine is very easy to operate and is build to scan four eggs at the same time. It takes
some seconds to scan the four eggs (COHEADS, 2002)

**Challenges of Research Capacity Building in Nigeria**

The following factors have been identified as having contributed to the decline in research initiative (Sikiru, 2010).
- Poor funding of research/ Difficulty in accessing research funds/lack of funding.
- Lack of clear-cut enabling policies
- Poor or indifferent attitude of scientists
- Constrain of equipments for carrying out state-of-the-art research/poor or inadequate infrastructure
- Bureaucracy
- Poor communication between universities, polytechnics, research institutions and the productive sector
- Lack of research skills in the modern methods
- Inadequate research personnel
- Over-loaded teaching and administrations schedules with little time for research
- Lack of enabling environment due to political, security and economic reasons.

Nigeria cannot afford to continue to import almost everything it needs to run its economy. The government did not look inward and pickup the products of research by local scientist and engineers as mention above to commercialize them. Because institution produces only few unit, but they need an environment where they can produce thousands of the same machines. The need for collaborations between researchers and industry is not provided so that research activities will be in response to the need of the industry and society at large. There is no encouragement to the research institutions by the government because no enough funds for the researches and also there is no encouragement for research in polytechnics setting since applied research is what Nigeria urgently needs for our national development.

**Recommendations.**

The following recommendations are made in order to make researches in physical science for national development. The governments should also encourage research in polytechnics’ setting. The government should also provide suitable environment for the research institutions so that they can produce many products.

The government should also fund researches this will encourages research institutions to concentrate on applied researches.

The government should commercialize the product of researches by local scientist and engineers with a view of integrating them into commercial and industrial sector. There is also need for collaborations between researchers and different industries.

**Conclusion**

Based on the discussions above, it can be concluded that researches in physical science if properly funded and motivated will accelerate the pace of national development through provision of indigenous product, employment generation and stimulating industrial growth and development.

Nigeria as a developing nation must emphasize research to ensure national development. The council of Heads of Polytechnics (COHEADS) in conjunction with National Board for Technical Education (NBTE) use to organize expositions to show the contributions of Polytechnics towards researches.

**References**

- Ladan S.I. (2005) ‘ The role of tourism in national development’ *Danmasani multidisciplinary journal* Volume 1, number 9 and 10


