

ATTAINING SCIENTIFIC OBJECTIVITY IN EDUCATIONAL DECISIONS THROUGH USE OF MATHEMATICAL STATISTICS

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Abstract

The Universal Basic Education (UBE) programme was launched on September 30th, 1999 with the aim of halting the decline and rot in the nation's educational system, especially at the primary and junior secondary levels people have warned that if efforts are not made to ensure its success, the UBE may go the way its predecessor, the Universal Primary Education (UPE) did. The questions this write up will argue and suggest solutions are: How scientific can education be? can we obtain objectivity in education decisions? How can we attain objectivity in educational decisions using mathematical statistics?

Introduction

The Nigerian government under the democratic leadership of President Olusegun Obasanjo launched the new Universal Basic Education (UBE) programme on 30th September, 1999 with the motto "Education for Development". The UBE is expected to provide free compulsory and qualitative education for Nigerian children from the ages of six to fifteen years through primary to junior secondary schools.

According to the *Post Express* newspaper of 8th October 1999, the UBE programme is aimed at halting the decline and rot in the nation's educational system, especially at the primary and secondary levels. The newspaper however cautions that if efforts are not made to ensure its success, the UBE may go the way its predecessor, the Universal Primary Education (UBE) did. The UPE is said to have started well in 1976 under the same Obasanjo administration while in military uniform but the programme was evidently bedevilled by what Mkpa (2000) describes as faulty statistics in form of gross underestimation of population of registerable pupils, and what the *Post Express* (1999) describes as inadequate funding and poor implementation.

Even at the onset of the UBE programme, people have questioned its workability already. The *Vanguard* of 3rd April, 2001, reports Governor Nnamani of Enugu State as saying, there was no equity in educational sector in Nigeria. According to the Governor, the government should use the formula given by the first Igbo summit of 2001 and that is "to use human beings as units of development".

The questions this write-up will try to argue and suggest solutions are: how scientific can education be? Can we obtain objectivity in education? How can we attain scientific objectivity in education decision using mathematical statistics?

How Scientific Can Education Be?

The Federal, State and Local Governments together with educators and individuals are daily faced with the task of making decisions regarding the planning of educational experiences, the methods of teaching these experiences, and how to evaluate the achievement of the stated goals. In planning and executing their aims, one thing seems to be the guiding factor to educators and that is the necessity to make a valid decision about what they do and how they do it. And then whether there is objectivity in their decisions.

One of the most reliable ways of ascertaining that decisions are correctly made, according to Denga and Ali (1983) is to use scientific approach to arrive at such decisions. This involves the use of data to quantify statements and to verify assumptions with empirical evidence or the use of statistics. In line with this Lassa (1995) claims that statistics is the basic language for summarising and analysing numerical data about human reactions, attitudes and mental abilities with a view to drawing inferences.

Over the years modern education has shown some scientific spirit, but Nenty (1991) expresses fears that the science of human behaviour claimed by education is an extremely difficult one whose positive achievements do not tend to match the efforts expended on it. Unlike the physical sciences Nenty

(1991) adds that it is difficult to establish quantitative laws of human behaviour or reduce it to a mathematical equation. One can agree with Nenty in the sense that it is easy to measure the length of the table with ready-made standards and highly valid metro-rule, but it is not easy to attempt to measure the intelligence of a student in the face of lack of consensus on what intelligence itself is and lack of agreement on what instrument could be used to measure it validly.

However there are areas we can see educational research as being scientific. While science is a systematic process of searching for the truth about nature in its various forms, education, according to Nenty (1991), may also be defined as the process of enabling an individual to find out the truth about himself. Truth here refers to what is verifiable by everyone, or that on which everybody has reached a consensus. It is universal, not subjective and private but objective and public.

Also giving illustration to show that education can claim to be science, Nenty (1991) said there are truths hidden in nature which science is to find out and there are truths hidden in individuals which education is to “educare” or “lead forth” or bring out” and develop. This is true because there are some truths, or inherent in human nature in terms of capabilities, potentials or behaviour which education is to find out, and then develop but knowledge or truth about nature, be it physical social, behavioural or human can most validly be established through scientific process.

From all these statements, therefore, one can define education science as the application of scientific methods like statistics in the search for truth about human nature, and human learning.

Objectivity in Education Science

We have seen how difficult it is to make objective decisions in educational matters and how some authors have tried to bridge the gap between the physical sciences and human behaviour. But can we say that there can be absolute objectivity in education science? Or should we let go of educational research through scientific means because some people suggest that truth is objectivity and that we cannot attain this objectivity working with means that are themselves subjective?

Let us look at what Osokoya (1996) says in regards to objectivity in the natural sciences and objectivity in education. He said that in the natural sciences, when we describe a body of proportion as objective, we mean that they are such as to warrant acceptance by all who seriously investigate them. That objective proportions in natural sciences is impartial, impersonal, and capable of repetition in education however, objectivity may not be the same as for sciences, yet, Osokoya (1996) goes on, it would surely be extremely paradoxical if the two had nothing in common. We may expect the natural scientific ideals of impartiality to be reflected in educational decision also for example, we can make educational decisions objective by putting our prejudices aside and being free from personal feelings, tests and interest of our groups.

In Nigeria, most educational decisions are based on personal or groups interests. Any researcher searching for truth is faced with many problems - his interests and feelings, interests and feelings of his groups or other groups interest and feelings of his subjects and so on. He thus resorts to looking at figures to arrive at results pre-aimed at. This is unfortunate as we face decisions arrived at from twisted arguments and conclusions. To be objective therefore, we must learn to be honest, not one sided, reduce propaganda and have what Osokoya (1996) refers to as objective validity.

The Role of Mathematical Statistics in Improving Objectivity in Educational Policy

Educational Policy as defined by Osokoya (1994) is the statement of intentions of the government and the envisaged means of achieving those aspects of its national objectives that have to rely on the use of education as a tool. In specific terms, therefore, educational policy is the determination of major objectives, the selection of methods of achieving these objectives and the continuous adoption of existing policies to the problems that face a government.

Statistics can be of help in formulating and implementing educational policies in many ways. First is the need to have an up-to-date statistical data needed for effective educational planning. In Nigeria, we still base our fact on the old 1963 controversial census figures and the 1991 more

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Statistics controversial census figures, adjusting them with estimates of the rate of population growth.. In consequences we do not know the accurate figures of children of school age in order to plan for them.

The effect, according to Osokoya (1994) is that planning proposals are usually wide off the work of reality thus leading to inadequate provision of funds or building schools where the needed population does not exist.

Secondly, we are faced with the problem of reliability in ascertaining whether educational decisions are correctly made. Statistics helps here to give accurate analysis of numerical data about human relations, better methods of instructions and so on. In this Gilford (1973) states that the use of statistics in educational research permits a precise description and forces people to think in finite terms, to summarise results meaningfully and conveniently and to make predictions under controlled circumstances. Again Denga and Ali (1983) agree that the use of statistics in educational research serve time, words and mass a research report more scientific and objective.

Again in practice, we are called to make decision about population on the basis of sample information. Such decisions Spiegel (1980) calls statistical decisions. For example, we may wish to decide whether one educational procedure or teaching strategy is better than another. In attempt to make such decision, it is useful to make assumptions or guesses about the population involved. Such assumptions which may or may not be true, are called statistical Hypothesis, and in general, are statements about the probability distribution of the population.

These hypotheses are formulated for the purposes of rejecting or nullifying them, for example, we may want to decide whether one teaching procedure is better than the other. In this case we may formulate the hypothesis that there is no difference between the procedure (i.e any observed differences are merely due to fluctuation in sampling from the same population). Such are called null hypotheses and denoted H_0 . Any hypothesis that differs from a given null hypothesis is called an alternative hypothesis, denoted H_1 .

These lead us to procedures which enable us to decide whether to accept or reject any hypothesis or determine whether observed samples differ significantly from the expected result. These are called tests of hypothesis, tests of significance or rules of decision (Spiegel, 1980). The best way to make valid decisions of such nature is by use of statistics testes like t-ratio, ANOVA, chi-square and others.

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