Daniel Kasomo

RESEARCH METHODS IN HUMANITIES AND EDUCATION

Qualitative and Quantitative Research Made Simple

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One vital requisite for university teaching is research and publication. The author, draw on examples from research in humanities and education and current issues to provide researchers with basis for appreciating how research applies to today's concerns. The need for creating graduates that are well trained in all aspects of research, albeit at the fundamental level is an important tenet of university education. It is in this light that this book, Research Methods in Humanities and Education, is perceived. The book has been designed to provide the fundamental knowledge, skills and assist in the development of values for appreciating research not only as an academic activity, but also a necessary aspect of socio-economic and political life of the individual. This is because research has been acknowledged as a vital component of the development process. It is important to have a population informed about research facilitates the research process in terms of providing the needed research data and utilizing research findings and recommendations. One basic purpose of research is to seek solutions to problems that either directly or indirectly affect human beings and society.

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DEDICATIOO

This book is dedicdted to dll Resedrchers

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This book is an expansion of lectures to my students at the Catholic University of Eastern Africa, Department of Education and Religious Studies and Department of Economics, Sociology and Anthropology at Egerton University, Department of Education in Laikipia University College, Nakuru Town Campus of Egerton University and Maseno University. I am especially grateful to these students for their continued interest in the course by asking questions, and giving comments and contributions, which have immensely contributed to preparation of this book. I also owe special thanks to staff in various libraries for their willingness and readiness to assist in getting the information required for its preparation

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CHAPTER 1

THE DIFFERENT METHODS OF ACQUIRING KNOWLEDGE

In this chapter the major methods of acquiring knowledge will be presented from the least adequate to the most appropriate, the scientific method, which improves upon the qualities of the previous methods. The need to adopt a scientific approach as the most adequate and reliable method becomes obvious as its properties are described in detail

NON-SCIENTIFIC METHODS OF ACQUIRING KNOWLEDGE

There are many ways of acquiring knowledge and the least mentally developed human being, the child, does not need to carry out sophistically research in order to develop some understanding of the world around it. One of the first sources of knowledge for the child will be the parents, the 'authorities' in all spheres of knowledge. This method of authority is not only depended upon by children but very commonly by each of us when relying on the knowledge and 'wisdom' of prominent people who are recognized as having a better grasp of their environment than ordinary people. Thus the statements of these 'qualified' people are rarely questioned or challenged; on the contrary, the knowledge imparted by them is usually accepted as absolute and a certain amount of faith is placed in these authorities as sources of knowledge. Elderly people in a village who because of their age have had more opportunity to accumulate experience in a society where formal education is minimal, are often placed in this position. Other examples would be kings in feudal societies, heads of churches, or in modern societies, technocrats as highly specialized persons in a particular area of knowledge. It is to be noted that such a situation is not without danger: once individuals are placed in such a position of authority they will usually rely on masking one's own ignorance with impressive rituals; by using a very specialized way of expression (professional jargon), or by emphasizing the uniqueness of one's position ('it is true because I, the minister, say so'). Very often this method allows individuals to hide the superficiality of their knowledge, its subjectivity or other weakness in their argument.

A variation of this 'method of authority' is the mystical method, where the correctness of the knowledge is assumed to reside in a supernatural source. In this case the 'knowledge producers' are an authority due to their ability to transmit the truth or knowledge imparted to them by supernatural forces. They have some mystical powers enabling them to receive and decipher supernatural messages. To convince the 'normal people' of their supernatural powers which support the correctness of their statements they appeal to irrational feelings by using rituals, ceremonies, emotionally loaded situations and explanations, and by employing unusual language. For instance, the faith of the people who are convinced of the supernatural powers of ancestors protects traditional healers from being questioned and thus shields them against being subjected to scepticism.

Whether one's authority to knowledge is recognized because of one's position or because of one's supernatural powers, one's credibility is strongly related to the level of education and general knowledge of the audience. As the growing children recognize that their parents do not have the answers to all problems and even give dubious explanations at times, the authority and mystical modes of acquiring knowledge lose influence when better, alternatives explanations can be found. The history of natural sciences is full of examples of mystical explanation being replaced by scientific ones. Who, for example, would still believe that the earth is flat or that it is the centre of the solar system? Some centuries ago it was a dogma of the church, accepted by all as the truth!

The foregoing two approaches to knowing are mainly based on faith. In contrast, the rationalistic and the empirical methods - which nonetheless constitute extreme opposites - do not attribute special aptitudes to particular persons but differ in the importance they give to reasoning and observation.

The rationalistic method is based on human reason: human beings have the ability of thinking logically, of reasoning and thus discovering laws, using pure, abstract intelligence. The basis of knowledge is correct reasoning which allows one to know what must be true by principle. A good example is pure mathematics where laws and principles are discovered without relying on any reality but on the basis of axioms. Observation of reality, collection of facts, using the five human senses, are unnecessary. The implications of this method for social sciences would be that human beings have to react rationally only.

The opposite of the 'rationalistic method' is the empirical method, where facts observed in nature are the only elements to rely on. Interpretation, search for relationships between facts, are considered a distortion. Objectivity of the observation is emphasized, and only what is observable, what can be perceived by our senses, constitutes knowledge. A piece of wood floats on water while a piece of iron doesn't. for an extreme empiricist knowledge stops there, since the reason for the difference cannot be observed.

But critics of both the rationalistic and the empirical methods are justified to ask 'What are facts without a relationship between them established, without explanation for their connection in time and space?' and 'Of what use is a theory which is totally divorced from reality? Obviously, these two extreme methods are inadequate for the acquisition of knowledge, although each one has good qualities. The scientific method, as described below, can be considered as a synthesis between the rationalistic and the empirical methods.

Finally and for the sake of completeness, one would also mention the existence of other methods like the ones used in philosophy, theology or aesthetics. However, the field of investigation and application of these methods is qualitatively different from the one of science and thus beyond the scope of this book. The difference will become clear in Chapter 3 when dealing with the identification of research problems.

THE SCIENTIFIC METHOD AND ITS PROPERTIES

To illustrate how the scientific method integrates the above-mentioned two methods, let us examine the process of knowing.

The first step to knowing is the description of the object, of the relationship or of the situation. The object of the study must be accurately depicted. Here, evidently, the empirical method of objective observation must be used. Then an explanation, a statement of the relationship between the described facts should be expressed - if possible in the form of a law. This explanation should permit a prediction of further events under well-defined conditions, i.e. the explanation should allow one to foretell the occurrence of some events. The explanation is thus the result of a reasoning process under certain prerequisites, using the rationalistic method, leading to the formulation of a natural or a social law. But to ensure that this law will enable prediction, the correctness of the explanation has to be tested by verifying it, confronting it with reality as perceived by the five human senses, using the empirical approach. Correct explanation leading to the ability of foretelling events should lead to intelligent intervention which enables changes to occur in order to improve a situation.

Let us illustrate this process. An objective description of knowledge obtained by use of a particular methodology, the scientific one. The scientific method of acquiring knowledge, also called scientific research, is a systematic investigation of a question, a phenomenon, a problem, following some principles. All different sciences are united not by their different

matter but by their common method, by the way knowledge is acquired. There is a tendency to confuse the content of science with its methodology. However, efficient traditional African medicine and modern medicine are considered to be, the former is the result of trial and error - with scant consideration for the linkages between causes and symptoms and for systematic collection of data - whereas the latter, at least in theory, is based on a scientific method - the systematic study of empirical facts. Astrology, foreseeing the future by reading palms, oracle, etc, are not non-scientific because of their aims but because of their methods. The purpose of establishing a relationship between the position of the stars, the lines in a person's hand, clairvoyance of a ng'anga and the course of human destiny may be scientific if a scientific method could be used. But it cannot. Some issues, such as the existence of God, whether a person is good or bad, or any issue related to moral values, do not allow for scientific investigation. It thus becomes imperative to specify the main assumptions of the scientific method in order to differentiate it from other methods.

First, science assumes the existence of natural and social laws. That is to say, science presumes order and regularity in natural and social events. Without this assumption some of the main aims of scientific research, such as explanation, prediction, and the possibility to act on nature, would not be attainable. But these laws exist independent of the observer - they describe the way phenomena interact or social events occur.

However, although a pure relationalistic method cannot lead to the knowledge of these laws, scientific research assumes that the laws of nature can be discovered by human beings because humans are also part of nature and themselves subjected to those laws. In fact, we obey biological laws determining the growth of our body, psychological laws determining the development of intelligence, sociological laws of organization of society, as well as economic and political laws.

Extremely important also is the assumption that natural phenomena have natural causes. Thus no supernatural powers are necessary to grasp the cause of events, and no unexplainable supernatural forces can explain the way nature functions. Classical examples, so often found even nowadays, where this assumption is not met, are the use of religious beliefs to explain physical phenomena. For example, thunderstorms may be regarded as an expression of anger of the gods, or a hurricane's damage as God's wrath on a sinful city, or the natural death of a person attributed to displeased ancestors.

Although knowledge is superior to ignorance, knowledge and truth in science are relative to the evidence, the methods, and the theories employed. Numerous examples show how invention of new instruments of investigation and new approaches to studying a problem can lead to new advances in science, showing how relative the previous knowledge was (e.g. invention of electronic microscope in biology, Einstein's relativity theory in physics, or cross-cultural comparison in psychology).

Scientific statements should be distinguishable from common-sense statements. The latter are characterized by the existence of an opposite, contradictory statement. For instance, 'absence makes the heart grow fonder' versus 'out of sight, out of mind'. Common-sense statements are the result of non-scientific observations as far as they don't take into consideration the different variables at stake. in Some situations, depending on the personality of the persons involved, the depth of the friendship, the length of the separation, etc., the first statement will be correct. The weakness of the approach is that the preconditions for the validity of the statements are not specified due to lack of systematic investigation.

This illustration emphasizes once more the empirical aspect of science which relies on perception, experience and observation of the real world in systematic, objective, controlled manner. It is fundamental to grasp the important of these two properties of scientific observation, i.e. its being systematic and objective.

Scientific observation is systematic when all the possibilities are considered one at a time, in a logical order. Natural sciences allow the best illustration of systematic observation. In chemistry for example, different substances can be mixed two at a time, under the same conditions and same proportions, to observe their reaction. Also in physics can be the relationship between velocity and mass, gravity and height, etc, of a falling object be studied systematically. On the other hand, to investigate the effect of two different analgesics it would be confounding to prescribe these two pills to patients with different medical backgrounds or to give the two medicines, to the same patient at the same time. What could one conclude with confidence if the ailment disappears?

Scientific observation is objective when the description of reality does not reflect the subjective views of the researcher but rather corresponds to the description of anyone examining the same reality. The more accurate a description is, stating measurable properties for instance, the greater the objectivity of the observation. A tree can appear tall to someone used to grassland and short to someone used to woodland. But stating that the tree measures three metres in height should find confirmation by anyone able to measure this tree with the same measuring instrument.

Unfortunately, it is not always possible to observe systematically every phenomenon or all of its aspects. Most often some characteristics remain unknown so that the explanation and, as a result, the prediction for a particular event cannot be accurate. In fact, one can only predict an event to take place if one knows all the conditions and circumstances which cause the event to occur. In the social sciences in particular it is very rare to be in possession of all information leading to the occurrence of a certain phenomenon and thus to explain with certainty this phenomenon. One has to contend oneself with a probability statement, asserting that if some given conditions are satisfied the event will occur more often than if some of these conditions are not. At the very best, the most relevant types of explanation are deductive explanations, expressing certainty, and probabilistic or inductive explanations which concede some uncertainty. Let us illustrate both. Given precise initial conditions, the trajectory; speed; velocity, etc. of a falling stone or star can be predicted with certainty. Given some initial genetic, physical, socio-economic conditions about a newborn baby it is not possible to predict with certainty the personality, intelligence, physical condition of the same child at five years of age - and even less whether or not it will become a delinquent teenager. Too many unmeasurable factors are involved. One can only predict that, coming from a middle-class family, the child will in all probability enjoy a good education and a good diet, and will generally have good opportunities to develop its intellectual potential adequately.

Syllogisms of the type "All men are moral/X is a man/Thus X is mortal" predicts a fact with certainty. X will die, there is no doubt about it: the result has been obtained by deduction from the two premises. However, the age X will reach cannot be predicted with certainty. One can only assess that he will probably not reach the age of 100 and that the probability that he will die before the age of 50 is larger than the one of him reaching 70 years. In fact, Life Insurance Companies function on the basis of life expectancies which are nothing else but probabilities of the time of death occurrence obtained through induction from many observations.

In short, the object and the method of investigation will determine the type of causation which can be expressed and thus the type of prediction.

It is therefore appropriate to highlight the properties of scientific research.

(a) The research is empirical since the aim is to know reality. Each step is based on observation, be it when collecting the basic facts or when testing explanation, assessing the value of the prediction or the result of an interview in the natural process;

(b) The research is systematic and logical. Not only must the observation be done systematically but a certain logical order must be followed all along: logical prediction cannot be made before a description has been given and an explanation of the observed phenomena been found. Obviously one cannot prepare a questionnaire which is expected to gather all necessary data for a study before having clear ideas on the type of information needed i.e. an analysis of the different variables at stake is prior to the formulation of the questions to be answered by the respondents.

(c) The research is replicable and transmittable. Since the observation is objective and the explanation logical, anyone placed in exactly the same circumstances can observe the same event and make the same reasoning, leading to the same explanation and prediction. Moreover, because subjectivity is absent, it is possible to communicate each step of the research to anyone and transmit the acquired knowledge. The usual way to do so is to present the research and its results in a report or an article published in a journal.

(d) The research is reductive. To grasp the main relationship of laws, the complexity of reality is reduced. All details which are not essential, which have little influence on the process under investigation, are omitted. In other words, the distinction is made between necessity and chance. For example, when investigating the quality of a blanket the material of the blanket must be analyzed since its property of conserving warmth depends on whether it is made of cotton or wool. But the colour of the blanket is probably irrelevant to its warmth-conserving function and need not be considered. Thus only the necessary properties are taken into consideration.

In social sciences, by controlling for many variables one nearly always reduced the complexity of reality; one presupposes that the variables which have not been taken into consideration have little effect on the issue one is interested in. for instance, when studying the loan-facilities open to women for small-scale agricultural projects, one rarely takes into account the personality of the policy makes or the one of the loan-recipients; the economic and social factors at stake are so much more important that one would want to gather information on the type of project, the type of crops to be produced, the size of the field and quality of the soil, availability of fertilizer and labour power, transport and market conditions, perhaps also age and marital status of the woman, number of dependants who would help her and her health condition as far as it might affect her work. But individual characteristics (Is the woman a head of household because she is widowed or divorced or unmarried? What are the reasons of her marital status? Is she an introvert or extravert?) are considered to be of little relevance for the study under consideration, and thus they are discarded in order to maintain a certain level of generality. Reductionism or the method of only considering the essential and necessary properties, variables or aspects of a problem is not to be confused with the philosophical concept of reductivism.

Exercises

1. What is replication of scientific research? What are the preconditions and why is it important?
2. Explain and give examples of the difference between probabilistic and deductive explanations.
3. Analyze, giving your own example, the positive and negative aspects of research being reductive.
4. Find a research in social science done in your country and which illustrate the four steps of a research: description, explanation, prediction and intervention.

CHAPTER 2

THE SCIENTIFIC METHOD APPLIED TO SOCIAL REALITY

This chapter will attempt to show that knowledge is an active, purposive reflection about the objective world and its laws, and that the source of knowledge is the outside world upon which persons have to act in order to know it. There is a dialectical relationship between practice, as the action of people on nature and society and theory, the set of explanations. The starting point and basis of knowledge is the direct contact of humans with the environment, but this superficial knowledge has to be deepened, generalized and expressed in form of a theory. Facts and theory interrelated at each step of the process of knowing. This is reflected in the plan of the research process which expresses the systematic scientific method.

THE DISTINCTION BETWEEN NATURAL AND SOCIAL SCIENCES

Research usually arises from some needs, so that it has a certain purpose to fulfil. Natural sciences deal with investigations into the properties and laws of social phenomena. The development of natural sciences is at times determined by the needs of production, commerce and industry. This explains the development of astronomy because it was indispensable for pastoral and agricultural peoples. Geometry was necessary for navigators; mechanics was developed because of the need for building operations. In the modern period, the development of chemistry, physics and the biological sciences is directly related to the demands of expanding industries. On the other hand, social sciences deal with investigations into the properties and laws of social phenomena. Their development has its roots in the needs of general management and control of social affairs. The development of both types of sciences depends more or less on the needs, values, aspirations and other characteristics of the particular society in which it takes place. Thus the priority for research of many countries of Africa will be to investigate the way to combat malaria rather that to develop an artificial heart. Social sciences, however, are much more affected by some properties of the society than are the natural sciences. Moreover, the actual objects of investigation and research problems of the social sciences introduce new methodological difficulties. For ethical reasons, for instance, some experiments cannot be done on human beings and some variables cannot be controlled. Generally, there are so many uncontrolled factors due to the complexity of social reality that exact laws can rarely be found and the results have mostly to be expressed in terms of probability, which is itself a reflection of some margin of ignorance. A physicist can express the laws of electricity with a formula and predict with certainty that an electric build will glow. A sociologist can only predict that in certain circumstances unemployment leads to an increase in crime. In this textbook, we restrict our study to the social sciences.

Finally, one should be aware of the controversy which developed in the sixties until now on the adequacy of scientific methods in studying social phenomena. The defenders of "social sciences" advance that social disciplines can be correctly understood as "natural sciences of individuals in society", not qualitatively different from the well-established natural sciences. The differences "in degree, not in kind" between natural and social sciences demand an adjustment of the natural sciences methods to social reality: the methods and techniques must be modified and adapted according to the characteristics of social processes but they are the correct ones for a successful understanding of social issues and the building of empirical theories.

On the contrary, the adversaries of the utilization of scientific methods to explain social reality emphasize on the inadequacy of the rigid scientific method to grasp the fluidity of social phenomena. The arguments used by the critics depend strongly on the school of thought they belong to. Their reluctance to consider social disciplines as sciences reaches from the analysis of some failure of the empirical, scientific approach to the extreme of

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