KNOWLEDGE OF CLASSIFICATION OF RESEARCH: AN IMPORTANT TOOL FOR A SUCCESSFUL RESEARCHER

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Abstract

The purpose of this paper was to classify research method. The focus was on the easiest and simplest way of classifying research. In doing this, a look was taken at the National Policy on Education highlighting the philosophical basis of Nigerian Education. The problems militating against the Nigerian educational system were enumerated thereby establishing the need for research in that area. Research was defined taking note of the opinions of various researchers. Various were carefully looked at. The method adopted in this study was Nworgu (2006) method. Three methods of classification of research were identified. Each was fully discussed bringing out various types of sub groups under it. The merits and demerits of each of the methods of classification of research discussed here be adopted by researchers at all levels especially the beginning researchers. The paper therefore concluded that the proper knowledge of the method of classification of research is very important for the researcher.

A sound educational system is accepted all over the world as the bedrock of human development and progress (Alejideino, 2000). In the National Policy on Education (1981, 1998, 2004), the Federal Government of Nigeria has adopted education as an instrument per excellence for effective national development.

People have defined education differently and also have different views about the concept. In this study, the definition of education given by Ukeje in (1979) is adopted. He sees education as a process, as a product and as a discipline. As a process, education must have content and methodology. The content is knowledge. As a product, education means change in behaviour. Education as a discipline is a body of organized knowledge.

Education has witnessed active participation by non-governmental agencies, communities and individuals as well as government intervention (FRN (3rd ed.) 1998). Nigeria as a nation has philosophical basis for the nation’s education. Unfortunately, the contradiction in patronage and attention which Nigerian education generally has suffered in the past do not seem to justify the philosophical basis on which the educational system has been fashioned. Education in Nigeria is faced with a lot of problems like funding, unemployment, evaluation methods and associated limitations including examination malpractice, teacher production, requirement and retention, etc.

These issues or problems raise questions about Nigerian values and procedures and the questions do not have simple and direct answers. They deserve purposeful research before they can be effectively solved or tackled (Anikwenze, 1995).

What is Research?

According to Nworgu (2006:4), research, in general has to do with enquiring into the unknown. It is the search for solutions to problems or answers to questions. When a researcher employs a systematic approach – the scientific method – it is said to be scientific research or investigation.

Educational research on which this study is based is a systematic approach to the solution of educational problems. It involves the application of the scientific method in finding solutions to educational problems. Research is also defined by Anikwenze (1995: 36) as “systematic and intensive process of carrying out the scientific method of analysis of an identified problem with a view to uncovering hitherto undiscovered truths about the problem or its solution. He further sees research “as a structured investigation or experiment aimed at finding reasonable answers to carefully articulated questions culminating in formal record of procedures, results or conclusions”.

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To Akuezuilo and Agu (2002:8), “research is defined as a systematic and objective search for new knowledge of the subject of study and/or application of knowledge to the solution of a novel problem”. In another way, they also defined research as “the systematic and objective recording and analysis of controlled observations that may lead to the development of generalization, principles or theories resulting in prediction and possibly ultimate control of events”. They also included that it is a process of testing rather than proving, and it implies an objectivity that lets the data lead where they will.

Ali (1996) concludes that despite the fact that educational research can be variedly defined and interpreted, what indeed constitutes the core of an acceptable definition of research in education is one which includes the fact that it is testable, verifiable, purposeful and activity – oriented. Based on this premise, he then defines educational research as “those activities or processes which allows one to systematically test and/or obtain a body of information, data or knowledge about teaching, learning or conditions which affect teaching and learning”.

**How then is Research Classified?**

There are different types of educational research. This is so because educational problems differ and the places or modes in which they occur also differ. However, many people have tried in different ways to classify educational research but this has not been easy. There seems to be no generally accepted system of classification of research among researchers. In practical term, every researcher or every author presents a different method of classification bringing out convincing evidence that there is no generally accepted scheme.

In their own parts, Nworgu (1991) and Akuezuilo and Agu (2002) respectively classified research into two broad areas namely; Classification by purpose and classification by method. In 1996, Ali classified research “design” into two groups. These are descriptive research design and experimental research design. He explains that descriptive designs are mainly concerned with describing events as they are without manipulation of what is being observed. He further states that any study which seeks merely to find out “what is” and describes it, is descriptive. He categorized such types of research as case studies, survey, historical research, correlation research, evaluative research as well as developmental studies as descriptive research.

On the other hand experimental research designs in the view of Ali (1996) are those studies which are mainly concerned with identifying the presence of cause-effect relationship between the independent and dependent variables. This type of design enables the researcher to test hypothesis upon which valid, reliable, duplicable and verifiable conclusion are premised. Thus, through experimental design, a rigorous and scientific approach to investigating a problem is made possible. Ali points out that a central need for experiment in education is ensuring that proper control have been established. In the words of Kulbi (2002), methods of research may be classified from many points of view.

These are as follows:
The fields to which applied: education, philosophy, psychology etc.
Purpose: description, prediction, determination of status, determination of causes etc.
Place where it is conducted: in the field or in the laboratory.
Application: pure research or applied research
Data-gathering devices employed: tests, rating scales, questionnaires etc
Character of the data collected: Objective, subjective, quantitative, qualitative etc.
Forms of thinking: deductive, inductive etc.
Control of factors: controlled and uncontrolled experimentation.

The author presented other methods of classification of research by some other individuals like William H. Kilpatrick who distinguished between three kinds of research: scientific, historic, and philosophic. Monroe and Engelhart gave illustrations of subjective, analytic, experimental, historical, interview, ledger questionnaire, survey, test-construction and observation techniques. Crawford’s classification was also highlighted. His classification includes experimental, historical, psychological,
case study, survey, curriculum making, job analysis, interview, questionnaire, observation, measurement, statistical, tabular and graphic and library techniques.

Waples and Tyler were also presented discussing techniques of analysis, reading and recording, observation, personal interview and group conference, obtaining written statements by question blanks, checklist, sampling, classification, summarizing, evaluation, individual judgment, group rating, comparison, space and frequency counts, testing and experimentation. It was also gathered that Koos recognizes the questionnaire, experiment, measurement, documentary analysis, case, mathematics and survey.

The researcher Koos (92002) however warns a note of warning that no attempt should be made to characterize one method as more important than another since the purpose to be served and the conditions to be met determine the value of a research method in a given situation. Now, having seen some of the methods of classification of research used by some individuals or researchers, it is important to mention here that the method of classification of research to be adopted in this paper is the method used by Nworgu (2006)


In 1991, Nworgu classified research into two: purpose based classification and method based classification as has already been stated above. In 2006, he came up with an additional type of research bringing the number to three: Purpose Based Classification, Method Based Classification and Objective Versus Subjective-Based Classification. A look will be taken at them one after the other.

Purpose Based Classification: Research is easily classified by purpose because every research has a purpose. The purpose could be to describe a situation, compare variables or for evaluation purposes. When research is classified by purpose, it falls into the following five categories;

Basic Research: The major aim of basic research is to advance knowledge. It is also referred to as pure research or fundamental research. It also aims at discovering basic truths or basic principles. It is concerned with producing results of finding which will lead to the development of theories. Basic research is not concerned with the usefulness of the findings to practical situations. (Nworgu, 1991 & 2006).

This type of research is only interested in building theories, which will lead to the advancement of knowledge in the particular field. Pavlov’s classical conditioning experiment is an example of basic research. Pavlov’s studies have generated many theories which have had much implications for and application in teaching and learning. Another example is research studies in the area of micro-teaching, now a widely used method of training teachers which, fall into this group of research (Akuezuilo & Agu, 2002)

Applied Research: Applied research is also known as field research and is primarily concerned with establishing relationships and testing theories in the field setting. Most educational research is applied research, for it attempts to develop generalizations about teaching – learning processes and instructional materials (Akuezuilo & Agu, 2002). Applied research is concerned with the usefulness of ideas or theories to practical situations.

Applied research does not lead to theory formulation rather it seeks to explore or establish the applications of a given theory in practical situations. For instance, the study that seeks to find out which form of motivation promotes a high level of academic performance among students with learning problems is a type of applied research.

Basic and applied research are inter-related. Both are useful and contribute immensely to the development of the society. For instance, a basic researcher produces the theory and the applied researcher tests the usefulness of the theory in practical situations. This test provides some feedback
to the basic researcher, which helps him in modifying and refining his theory. No one is inferior to the other.

**Action Research:** Action research focuses on solution to a problem in a particular setting or situation. It is directed towards solving specific educational problems at the classroom or school level. This type of research is usually undertaken by either a teacher or a group of teachers in a school to solve particular problems in the classroom or in the school. For instance, if in a class, the teacher notices that some students are always late to school. The teacher may decide to take out time to study each of the students to find out the reason for his or her lateness. He/she will not study one and generalize the finding to others with similar problem. This is because of the fact that action research is limited to solving specific educational problems in a classroom or school. Its findings may not be generalized to other situations. In other words, action research places its emphasis on a problem here and now in a local setting. Its findings are to be evaluated in terms of local applicability, not universal validity (Akuezuilo & Ngozi, 2002).

**Research and Development (R&D):** This research method is aimed at producing and testing school materials like textbooks, equipment, teaching aids and curricular (Akuezuilo & Agu, 2002). These products are developed and field-tested to determine their effectiveness. This is an expensive form of research because a lot of money is required to produce and develop materials. Despite the fact that the research and development is costly and time demanding, it provides valuable means of achieving educational improvements. They ensure that educational products in use are of proven quality. Example, if there is a new equipment to be introduced into the school system, it will first of all be sent to pivotal schools to be “field-tested” before being produced in large quantity for use in all the schools. This will give room for the efficiency of the instrument to be validated.

**Evaluation Research:** This research method is aimed at making decisions relating to the value or worth of educational materials, methods and programmes based on empirical data. The result of evaluation studies is very useful in bringing about necessary modifications in the educational system so as to bring about greater effectiveness and efficiency in the system (Nworgu, 2006).

**Method Based Classification**

**Historical Research Design:** Historical research design described what was; and may be defined as the systematic approach to the description and analysis of past event. The main purpose of historical research is to discover generalizations that may be helpful in understanding the past and the present and to a limited extent, in anticipating the future (Akuezuilo & Agu, 2002). To Nworgu (2006), it is a systematized and objective enquiry into events, developments and experiences of the past. To Kulbi (2002), historical research is the application of the scientific method of inquiring to historical problems. It demands standards of careful methodology and spirit comparable to those, which characterize other types of research.

The central idea in all these definitions is that scientific approach is used in making enquiry into the past. In Kulbi (2002), historical research is viewed in three different ways:

- Historical approach, which refers to the organization of historical facts in support of the new concepts to be developed.

- Historical subjects, referring to biographies of great men like Zik of Africa, monographs of places like Nigeria, and sketches of ideas, thoughts and trends, and Historical techniques, which refer to research that is conducted on the basis of historical records and documents.

- Within the historical methods of research, the following sub-divisions have been identified. Historical, legal, documentary, bibliographical, Ideational, Institutional, organizational (Kulbi, 2002). Relating the scope of historical research to education, Kulbi (2002) points out that this method was more popular in educational research in early thirties and forties than at present. With the development of other types of research like experimental survey etc, historical research method has to surrender a large part of the field, which it has monopolized for some time. As the use of historical
method decreased, legal research in education, which resembles historical investigation, has shown a corresponding increase in popularity over the years. Nature and procedure of historical method of research are put in the following three major processes:

i) Collection of data
ii) Criticism of the data collected, and
iii) Presentation of the facts.

Historical sources of data are usually classified into two major categories: primary sources and secondary sources. With primary source, the researcher relates directly with the source of information, example oral or written testimony, constitutions, letters, autobiographies etc. Secondary sources are the reports of a person who relates the testimony of an actual witness of an event or an actual participant in the event. Some types of materials may be secondary sources for some purposes and primary sources for another. For instance: a linguistic textbook is a secondary source, but if one is making a study of the changing role of syntax in language teaching in secondary school textbooks, the book would be a primary source of data.

In the course of carrying out historical research, data are also criticized. This criticism involves the dual processes of establishing the authenticity of the source and of establishing the validity of its contents.

The next step is to present the facts. The facts are interpreted in the light of the researcher’s problem bearing in mind the limitations of his data. After the data have been interpreted, the next step is to put the interpretation down on paper in form of report writing.

Survey Research Design: A survey research is one in which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group. The survey plan or design specifies how such data will be collected and analyzed. However, there are some surveys in which the entire population is studied. Such surveys in which the entire population is studied are called census survey as distinct from sample surveys in which a sample of the population is studied (Nworgu, 2006:73). In the light of the above definition, the term survey in this study means ‘sample survey’. It is obvious from the above definition that the idea of sampling is very important to survey research. The sample is to be chosen using appropriate sampling technique or procedure.

Another important issue to be handled by survey researcher is the issue of validity and reliability of the data collected. Survey makes use of a variety of data gathering instruments or techniques such as questionnaire, the interview, observation, tests etc. Unless adequate steps are taken in the development of these instruments, the data collected may be questionable. Validity refers to the extent to which an instrument measures what it is designed to measure. The three types of validity are content validity, criterion validity and construct validity (Nworgu, 2002). Reliability of an instrument refers to the degree of consistency with which the instrument measures whatever it measures. Again, since surveys deal mainly with opinions, individuals could deliberately fake their responses. Faking should be avoided.

Nworgu (2006) classified survey research into the following groups:

Procedure -Based Classification: Here, the basis of classification is the procedure, technique or instrument used in data collected. Using this method, he classified surveys into the following types: questionnaire survey, Interview survey, Observational survey and Panel survey. Note that this type of classification does not reveal anything about the nature and purpose of a particular survey study.

Purpose – Based Classification: Here, surveys are classified based on the purpose, which the particular survey intends to accomplish. In this case, surveys could be classified into the following types: developmental survey, descriptive survey, correlational survey, and Public opinion survey.
Kulbi (2002), quotes George Monty saying that “No category of educational research is more widely used than the type known variously as the survey”. This broad classification comprises a variety of specific technique and procedures, all similar from the standpoint of purpose. This statement is in line with Nworgu (2006) purpose based classification of survey.

Survey is regarded as descriptive or normative when the method of investigation attempts to describe and interpret what exists at present in the form of conditions, practices, processes, trends, effects, attitudes, beliefs etc. It is concerned with the phenomena that are typical of the normal conditions. Kulbi (2002) further informs that normative survey researches may be variously classified either on the basis of the fields they study, the purposes they are used to achieve, the geographical areas they are used to cover, or the techniques they use. In classifying survey research according to fields of study, one comes across social surveys, commercial surveys, national surveys or international surveys. In terms of the techniques employed, there are; six types of surveys. These are survey testing, questionnaire inquires, documentary, frequency studies, interview studies, observational studies and appraisal procedure.

**Case Study Research Design:** The case study is an intensive study geared towards a thorough understanding of a given social unit. The social unit may be individuals, a community or an institution. The number of variables studied is limited whereas the number of variable and situations under which they are studied are diversified (Nworgu, 2006:80).

Going further, Nworgu explained that case studies employ a variety of data gathering techniques such as questionnaire, observation, interview, test etc. Only one or a combination of these could be used in any one study depending on the objectives of the study. Case studies are useful in providing relevant background information, which may give rise to more extensive investigations. In addition, they usually provide specific instances for testing or validating earlier findings or important theories. It is not expensive, but time consuming. The findings from case study is limited in generalizability. Again, some elements of bias may be involved in the selection of the units to be studied. An example of case study is “Error Analysis of Written Igbo Composition in Secondary Schools in Anambra State: A case study of Onitsha Education Zone.”

However, Ali (1996) warns that “a case study is not an experiment and conclusion from it cannot be used for establishing causation rather they can be used for prediction, development of social theories which can then be empirically tested using hypothesis in an experimental design study. This is to say that case study approach to investigation in education is unscientific. In carrying out case study research, intensive and extensive data collection work is required. The data collection instruments are of various types and largely depend on the type of case study involved. Ali (1996) goes further to identify the following types of case study: historical case study, Clinical case study and situational case study.

**Causal – Comparative or Ex-Post-Facto Research Design**

In the words of Nworgu (2006), this type of study resembles experimental research in the sense that it also seeks to establish cause – effect relationship, but differs from it in that the researcher usually has no control over the variables of interest and therefore cannot manipulate them. Examples of non-manipulatable independent variables are: location, status, sex, etc.

Ex-post-facto design yields useful preliminary information regarding the possible causes of some events on the basis of which confirmatory studies could be undertaken using experimental designs. They are less time consuming and with some elements of control and improved statistical analysis, valid results could be approached. The limitations of this type of study are: It does not allow for the control of the independent variables. Interpretation of findings usually poses a problem. Conclusion arrived at is highly questionable.
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It gives rise to classification errors e.g. classification of location into urban area, semi urban area and rural locations.

Ali (1996) warns that there is need for caution whenever ex-post-facto design is used in a research study.

Experimental Research Design

The major work of experimental design is to establish cause and effect. In an experimental study (Nworgu, 2006), one or more independent variable(s) is / are manipulated by the experimenter (researcher) under controlled conditions and its/their effect(s) observed. Example, is determining the effect of the new method of teaching language on secondary school students. In this group, you have two groups – the group on which the new method has been used and the group on which the new method has not been used.

There are two types of variables in an experimental studies:- independent variable and extraneous variables. Control is an essential and indispensable feature of experimental design. Experimental research design is classified into two types: Laboratory and Field experiments. Laboratory experiment is an experiment conducted in an isolated physical setting which is removed from the events of ordinary life. The next one is symbolic representation of experimental designs which is the field experiment.

Note

Survey studies differ from historical studies on the basis of time. Historical design deals with the past while survey deals with the present. Survey differs from experimental studies in purpose. Surveys are oriented towards the determination of the status of a given phenomena rather than towards the isolation of causative factors. Survey studies differ from case studies in that surveys are generally based on large cross-sectional samples, while case studies are oriented to the more intense and longitudinal study of a smaller sample (Kulbi, 2002).

Objective Versus Subjective – Based Classification: This gave rise to two research paradigms: qualitative and quantitative. The philosophical debate currently raging on about the nature of social reality is so strong to be ignored in a discussion dealing with research method in education – a social science discipline. The positivist versus constructivist debate (Nworgu, 2006) has led to two views of social reality. These two views in turn, have resulted in two research paradigm or models namely – the positivist and the constructivist research paradigms.

The Positivist Research Design; otherwise known as objectivist research model. This research design (Nworgu 2006:11) portrays a mechanistic or deterministic view of the human being (researcher), emphasizes nomothetic methodology and encourages the collection and analysis of quantitative data, hence positivism is the under planning philosophical framework for quantitative research methodology.

Qualitative Research Methodology: This is also referred to as the subjectivist research model. Nworgu (2006:12) quotes Cohen and Manion (1989:7) saying that this paradigm of social science research is ideographic in methodology and encourages interpretativeness as well as the use of mainly qualitative data. Furthermore, they observe that the method portrays the individual (researcher) as creative with free will and the controller of his environment. Nworgu therefore concludes that constructivism provides the philosophical framework for qualitative research methodology.

Conclusion

If the researcher knows about classification of research very well, it will help him / her to know the appropriate design to apply, what to use and what to expect, the appropriate step to take etc. This will help to solve the problem of choice of topic and carrying out the actual research. This will eventually help in writing the research report as the problem researchers have in writing it will be minimized to a great extent.
Recommendation

Different researchers classify research method in diverse ways. This study recommends that Nworgu (2006) method of classification be adopted. In this case, research method is classified into three broad groups: purpose based classification, method based classification and objective versus subjective based classification. This method of classification is simplified and at the same time very comprehensive.

Researchers should make out time to read and understand the various types of research and also how to apply them in the actual research business. Each method of research has its own merits and demerits and also has the specific type of study to which it should be used for. Researchers should ensure that they, you apply the various research designs correctly and at the appropriate time too.

References


