

**DEVELOPING SEARCH STRATEGIES FOR EFFECTIVE RESEARCH
OUTPUT AMONG STAFF AND STUDENTS OF KADUNA STATE
UNIVERSITY, KADUNA: A LIBRARIAN'S CONTRIBUTION**

BY

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Being a paper presented at the Kaduna State University Seminar Series, held on
24th March, 2011 at the Faculty of Science Lecture Theatre, KASU, Kaduna

ABSTRACTS

The paper discusses the role and importance of research to national development. However, the paper laments the poor research output of Nigerian Universities despite the attention accorded research at various level of the university education. Conducting research work still remains a very difficult task. Discussing the research process, the paper explains various search strategies researchers could adopt to facilitate faster research output

Keywords: Research, Search Strategy, Research Process, University Education

1.0 INTRODUCTION

The University is metaphorically referred to as an “Ivory tower” because, apart from being universal and apex of all the educational system, it also represents the intellectual height of scholars. University education has three cardinal points; teaching, learning and research. Researches are carried out at both undergraduate and postgraduate levels as term papers and course requirements, and as research project, thesis and dissertation. Additionally and more importantly, university staff, as central part of their job conducts researches, as individuals and as groups.

Research is indeed regarded as the bedrock of development. And because since inception, most researches are carried out in universities or centers and institutes, which are either residing in the universities or affiliated to them, makes them as focal points for national development. It is here that researches and breakthrough are recorded by students and staff.

From the above discussion, it can be seen clearly that research is very important. It is because of its importance that research methodology as course is taught at both undergraduate and postgraduate levels. Even for those programs that are by research work, students are required to take this course, this is to prepare to adequately not only produce qualitative term papers, project, thesis and dissertation but also be able to undertake any form of research now and in the future. On the other hand, academic staffs are required, as major part of their work, to publish those research works they conducted either as seminars, conferences and peer review journals or in book form. Because of this very important role played by academic staff, they are often expected to ‘Publish or perish’

However, despite the fact that students not only studied research methodology at undergraduate level and produce research project, and repeat the course at postgraduate level, and academic staff facing the threat of ‘Publishing or perishing’ writing and presentation of research works still remain a herculean task to most researchers. Some many factors could be associated with the difficulties researchers face in the conduct of research. However, one major factor identified by this paper is the lack of adequate search skill by the researchers. Today, researchers’ problem is no more on lack of adequate information, on the contrast, the problem today is the presence of so much information, what is popularly called information explosion or glut, that searching and sipping become very difficult.

This paper therefore seeks to enumerate and discuss those techniques researcher need to master dearly in order to effectively search for information, write and present research results without tears and sweat.

2.0 THE RESEARCH PROCESS

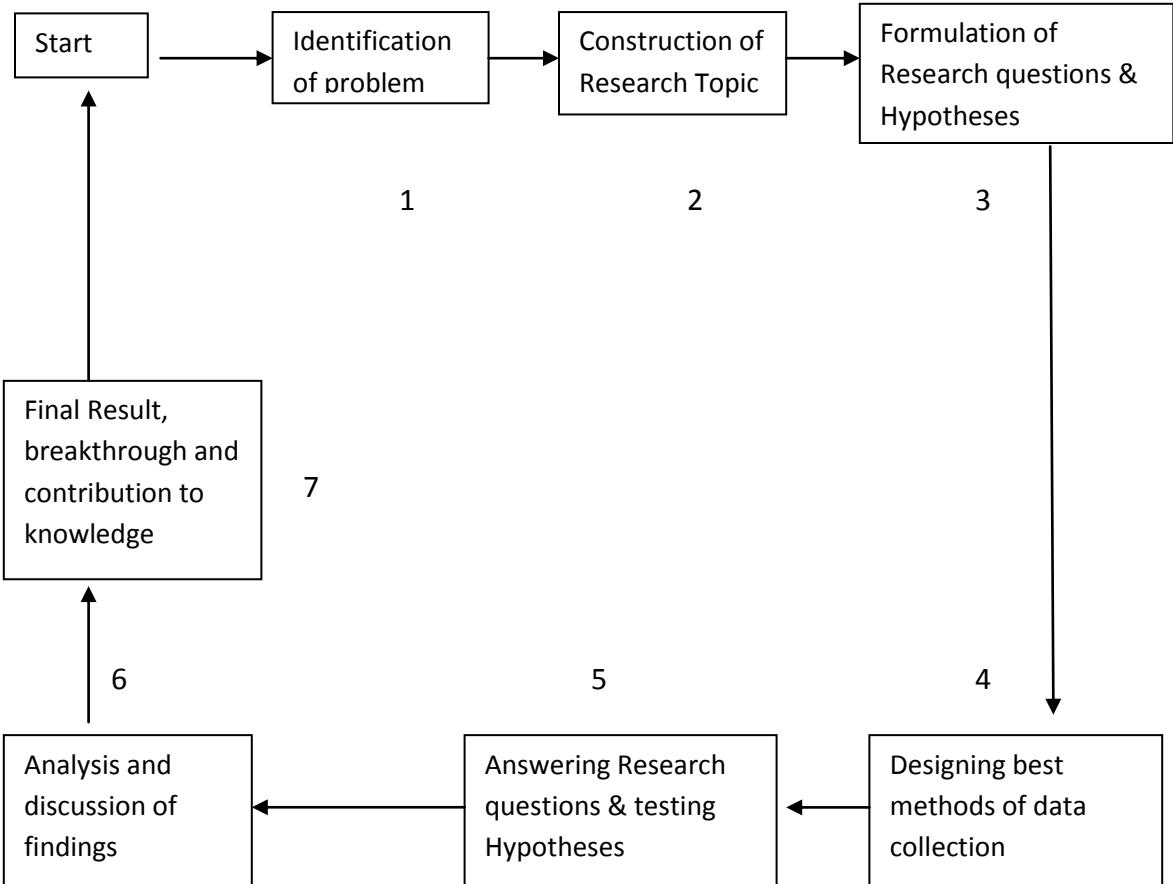
The term research is derived from the word search, which means to search again, checking and double checking, suggesting thoroughness. More explicitly, it is described as studious inquiry or systematic investigation of some phenomenon or series of phenomena by experimental method in order to discover facts, to establish or revise a theory, or to develop a plan of action based on the facts discovered. Whether term paper, thesis, dissertation or peer-review paper, the basic rules remain the same for all researches. All researches begin by first asking questions and followed by searching for answers. Walonick (1993) noted that until the sixteenth century, human inquiry was primarily based on introspection, turning inward and using logic to seek the truth, which endured for a millennium and was a well-established conceptual framework for understanding the world. However, a profound change occurred during the sixteenth and seventeenth centuries with Copernicus, Kepler, Galileo, Descartes, Bacon, Newton, and Locke presenting a new method that relies on measurement and quantification. With this, Mathematics replaced introspection as the key to supreme truths. This development gave birth to *Scientific method of research*, where objectivity became a critical component of the new scientific method. Therefore, experimentation and deduction became the tools of

the scholar. For two hundred years, the new paradigm slowly evolved to become part of the reality framework of researchers.

Research involves two process; the scientific method, which is a process of separating truth from error and facts from judgments, of compiling and selecting evidence to support a credible conclusion, and art method, which has to do with the process of organizing the results on paper so that they will instruct and even intrigue a reader. In a first-rate research, according to Ibrahim (2010) the “two cultures” meet. Therefore, any research work should be the product of both critical thinking and creative writing. A research should reflect the enthusiasm of an alert mind, not the methodological digging of a reluctant mole.

There are many research models proposed by scholars for research process. For instance, Preddy (2002) proposed a recursive questioning cycle in inquiry research. The model consists of four steps in a cycle. First, the researcher starts by formulating research questions, then determine best method and source to answer questions. The third step is where the researcher answers the research questions adequately. According to him the answers found may raise new questions, which will warrant another formulating of research questions and conducting new research; this represents the fourth step and completes the cycle. Based on analysis made on other models of research process, a comprehensive model incorporating most of the steps suggested by other models is presented below

Figure 1: Research Process Model



The above diagram consists of seven steps. The starting point of every research is the identification of research problem. This depends largely on area of specialization and/or interest of the researcher. A research topic or title is coined from the identified research problem, the topic or title should contain all the major measurable variables

Since research are undertaken to find answers to specific problems, formulating answerable research questions and testable hypotheses become very important. To successfully achieve this, best methods of data collection need to be designed. Analysis

of data collected help in answering and testing the research questions and hypotheses raised in the research work. Similarly, discussing the findings of the research work will clearly show whether really breakthrough have been achieved.

3.0 SEARCH STRATEGIES

Search strategies involve series of processes, techniques and ways researchers adopt in order to locate where information is, its types and formats, and ways of accessing the information. It also involves ways of retrieving, evaluating and utilization of information. Conducting research through the research process using which ever model calls for adaptation of various strategies. This is because every step in the research process may require different strategies.

Qualitative and authoritative information can be found in many places, among which are: the conventional library, which is the traditional four-wall library in which hard and soft copies of print and non-print information resources are systematically acquired, processed, organized, and disseminated. Hence, the conventional library contains physical volumes of books, periodicals, such as newspaper, magazine and journal, reference and information resources like Dictionary, Encyclopedia, etc, and audio-visual information resources, such as cassettes, C D, C D ROM, etc. Searching in the conventional library requires the development of search skills in the use of subject or classified catalogue, abstracts, indexes, bibliographies, etc. The use of these reference tools is a pre-requisite to effective and efficient retrieval of information from the library

The e-library represents the second way in which information can be got. The term is also synonymous with virtual library or digital library. It is a new phenomenon that relies on information and communication technologies, mainly the computer and the internet. The internet contains huge amount of information resources, according to INASP (2011) 3.6 billion pages of information, continually growing and changing. The internet contained basically four main sources of information, which are:

- Search Engines, e.g Yahoo, Google, Alta vista, etc
- Subject Directories, Biological Abstract, Chemical Abstract, Social Science Abstract, etc

- Scholarly Databases, such as AGORA, HINRI, ERIC, TEEL, PUBMED, etc, and
- Information Gateways-Subject Based Information Gateways (SBIGs), which are web site that act as a gateway to other sites and information sources

Search strategies are highly required for effective internet search more than searching the conventional library because the web is not indexed in any standard and finding information in the internet can seem very difficult. Below are therefore different search strategies researchers could adopt in order to effectively, efficiently and easily access, evaluate and utilize the vast amount of information in the e-library and by extension the internet

3.1 Thesaurus Search

This is the first strategy a researcher needs to adopt. The researcher needs to define and understand the major variables, concepts, keywords, etc in his research work. The relationship between the concepts, synonyms and hierarchical nature of the terms will have to be well established before starting any search. Therefore, the Thesaurus search helps in selecting appropriate terms, ensuring the most comprehensive retrieval. Thesaurus allows browsing terms in a hierarchical index and helps in defining more accurately what to look for. Using a thesaurus is a more powerful way to identifying relevant descriptors, along with related terms.

The thesaurus shows variables, concepts, keywords, etc in hierarchical display that indicates a term and its hierarchy, including its Scope and History Notes. The hierarchical displays are: Use For (UF), Broader Terms (BT), Narrower Terms (NT), Related Terms (RT) and See Also (SA). For example if searching for the word “Biochemical genetics”, the researcher should know that the term can be Used For ‘Chemical genetics’, it’s BT will be Biochemistry, while it’s NT could be, Chemogenomics, DNA damage, DNA repair, Genetics toxicology, Pharmacogenetics.

3.2 Phrase Search

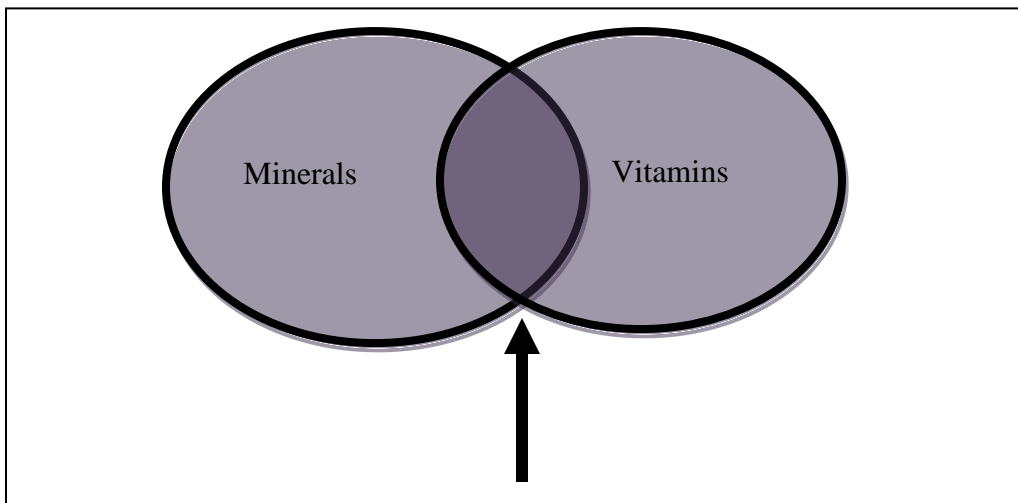
Having identified, defined and agreed on the terms researcher wants to adopt, he can proceed with phrase search. This type of search strategy leads to getting an exact

match of what the researcher is looking for. The search strategy requires putting the phrase or variable under search in enclosed quotation marks eg “Biochemical genetics”. When this is done, the researcher has narrowed his search result to only documents on biochemical genetics. The information system will not give you documents that have, say, biochemistry, genetic toxicology, etc

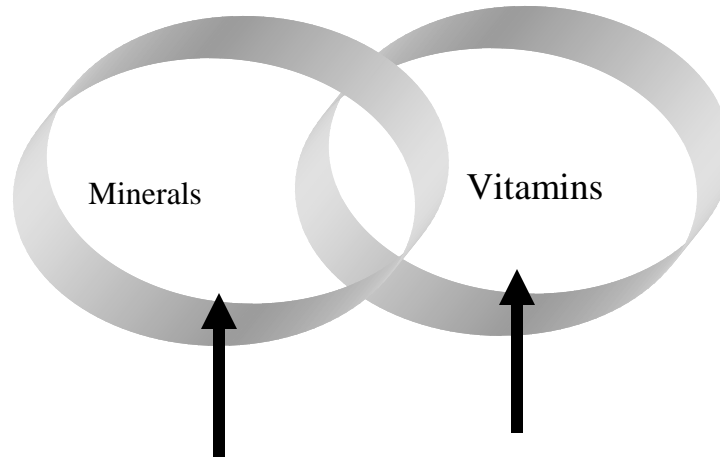
3.3 Advanced Search

The advanced search is achieved through the use of what is called Boolean Operators. The Boolean operators help define the relationships between words or groups of words. Using one or more Boolean operators, the researcher can expand or narrow his searches. He can also use Boolean operators to retrieve documents by grouping, ordering and re-ordering the concepts, keywords, etc. The Boolean operators are as follows

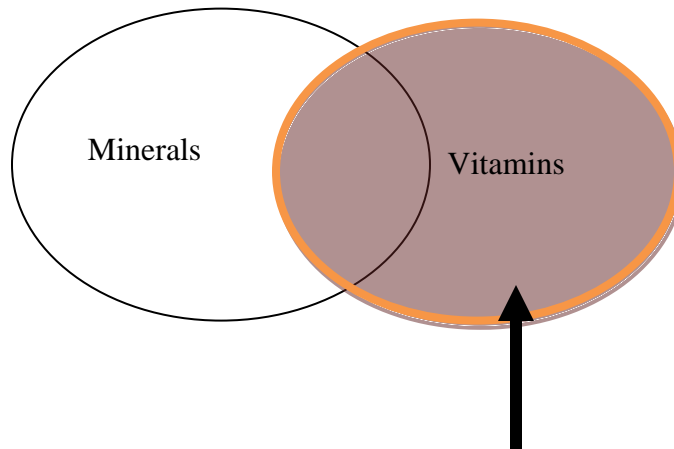
- ❖ AND is used to narrow a search and retrieve records containing all of the words it separates. E.g Minerals AND Vitamins. Using this operator, the Information System will **only** return pages where the words Minerals and Vitamins all appear somewhere on the page.



- ❖ OR is use to broaden a search and retrieve records containing any of the words it separates



- ❖ NOT is use to narrow a search and retrieve records that do not contain the term following it



NB: Phrase searching can also be combined with any of the Boolean operators, e.g 'Global warming' AND 'Sea level rise'

❖ Wildcard Search. This strategy is used to truncate terms, using the wild card symbol such as * can expand a search term to include forms of a root word, e.g. catalog* retrieves catalog, catalogue, catalogs, catalogues, cataloguing, etc, patent* retrieves patent, patents, patentable, patented, etc.

* Can also be used as Multi-character wildcard for finding alternative spellings. Use to indicate an unlimited number of characters within a word, e.g., behavi*r retrieves behaviour or behavior.

Also ? can be used as Single-character wildcard for finding alternative spellings. The ? represents a single character; two ?? represent two characters; three ??? represent three characters, and so on. Use within or at the end of a word, e.g., wom?n finds woman as well as women, and carbon fib?? finds carbon fiber or carbon fibre.

4.0 Search Precision

This is another Search strategy that may be refined by using the following limits (available in ‘Advanced Search’ and ‘Command Search”):

Latest Update limits your results to include only the most recent records that were added to the database. LISA is updated twice monthly.

Journal Articles only limits the search to only include the publication type of journal articles

English only limits retrieval to only records that are available in English.

By Publication Date limits retrieval to a specific date range.

5.0 SORTING AND SHOWING RECORDS

The sorting features give you the opportunity to order your results based on the publication date or relevancy.

Most Recent First displays the records in order beginning with the most recent.

Relevance Rank displays records in order based on relevancy. Relevancy is determined through a rating system that weighs the records based on the number of times the term(s) appear in the record and where they appear. While the display features give you the optional formats for displaying the records. Options include displaying the short format, full format, full format-no references, and custom format. The ‘de-duplication’ feature

automatically removes any duplicate records that appear in your set of results, which is especially useful when you are cross-database searching. You can also use the 'Show Duplicates' feature to display the duplicates.

6.0 PRINTING, SAVING, AND E-MAILING RECORDS

The information resources found during the search can be printed directly or saved into flash drive hard drive, e-mail, blogs, etc. This function also includes an exporting feature to a number of bibliographic managers such as RefWorks and the use of our output format editor, QuikBib

7.0 CONCLUSION

The paper concludes that adopting and mastering the above enumerated search strategies, research can be made faster, easier and enjoyable, thereby increasing the level of research output.

For writing this paper, I wish to acknowledge the use of many tutorials on Boolean operators produced by many individuals and organizations such as Joe Barker of University of California and Library and Information Science Abstracts Guideline

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