Writing Qualitative Research Paper
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Document as a Source of Data in Qualitative Research

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Abstract

This chapter deals with the importance and role of documents as a source of data in qualitative research. The analysis of various documents has been discussed in context of actual research experiences of various social researchers. It describes the nature and types of documents which serves as a source of data for a researcher in his/her research endeavour. It also discusses the criterion on the basis of which documents should be analyzed so that genuine information can be elicited from them.

Introduction

Qualitative research is concerned with the opinions, experiences and feelings of individuals producing subjective data. Most of the common research objectives in qualitative research aim at description, exploration and discovery using ' wide angle' and 'deep angle' lens approach so as to examine the breadth & depth of phenomenon. Ancient Indian thinkers (Rishes) were good enough in making use of these approaches and found solutions for various problems of life.

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In qualitative research the researcher speculates on matter, takes observations and classifies the facts to provide qualitative descriptions to the experiences, phenomenon, epistemology, characteristics, events and conditions etc. In this method there is more freedom of expression to describe the data rather than to be more close as in quantitative research. It gives positive outlook to research as data on which it is based is basic or we can say is observational which helps to reach the reality. In qualitative research, data can be collected through observations, interviews and conversations with subjects in natural settings and from documents etc.

In this chapter we will discuss heterogeneous set of resources of documented data like, letters, diaries, autobiographies, newspapers, magazines, photographs and e-mails etc. Documents contain text (words) and images that have been recorded without a researcher's intervention. These are those materials which can be read, which have not been specifically produced for the purpose of social research, which are preserved and which are relevant for the concern of social research (Bryman, 2008).

Atkinson and Coffey (1997) refer to documents as 'social facts', which are produced, shared, and used in socially organized ways (p.47). For different types of documents which will be of use in social research Scott(1990) reported certain criteria and also distinguished between personal documents and official documents, where further classified official documents as private and state/government documents. Scott (1990) suggested four criteria for assessing the quality of documents which are –

a) Authenticity – It talks about whether the evidence is genuine or unquestionable.
b) Credibility – Whether the evidence is free from errors and distortions.
c) Representativeness – It considers that is the evidence typical of its kind, or not. If not then to what extent it's untypically is known.

d) Meaning – It talks about the clarity and comprehensibility of the document/ evidence.

Let us discuss various kinds of documents which serve as a rich source of information for qualitative research.

Documents

Documents that may be used for systematic evaluation as part of a study take a variety of forms. They include advertisements; agendas, attendance registers, and minutes of meetings; manuals; background papers; books and brochures (Bowen, 2009). Various types of personal documents can be produced by the individuals such as diaries, letters, autobiographies & photographs etc. Let us discuss them in following paragraphs

1. Diaries, Letters , Autobiographies and e-mails
2. Visual Objects
3. Official Documents

(i) From State/ Government Sector

(ii) From Private Sector

4. Mass Media
5. Virtual Documents

Diaries, Letters, Autobiographies and E-Mails

Usually diaries and letters are used as a source of data in historical research, whereas social researchers have not given due attention to them. In social research these are used as sources when they have been specifically elicited from their authors. The researcher driven diary has been used as a method of data collection in both qualitative and quantitative research (Bryman, 2008). Here our area of concern is those letters and diaries which have not been solicited by a researcher. Kralik et.al (2000) used a combination of e-mail and letter writing to collect life history data from a group of women (age ranging between 30 to 50 years) who were experiencing chronic illness. The study informed that many participants used emails and several used hand written letters. Throughout the study 80 women were corresponded although half of this number wrote very intermittently" &

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some others were reported to have difficulty with reflection and self – disclosure" (p-911).

Most of the standard qualitative texts do not mention the possibility of using letters as a main source of data. Denzin & Lincoln (1998) in the topic collecting and interpreting Qualitative materials emphasized the role of the letter with in a qualitative research as –

'Letters, Unlike journals , are written to another person with the expectation of a response . In Letters we try to give an account of ourselves,

Letters are written to another person with the expectation of a response. In letters we try to give an account of ourselves, make meaning of our experiences, and attempt to establish and maintain relationships among ourselves, our experience, and the experience of another (Clandinin & Connelly, 1998, p. 167).

Letters are a form of communication with other people, whereas, diarists invariably write for themselves only. Wild et.al. (2009) did a 'diary study' that examined engineers' information needs and document usage. They used the data to generate new 'document use' scenarios and a 'proof of concept' test of a related software system.

Autobiographies can be written at the demand of the researcher, particularly in connection with life history studies. Letters, diaries, autobiographies and e-mails can either be the primary source of data or may be used as a supplement to another source of data, like life history or interview etc.

In the analysis of any personal document the criterion of authenticity is very important. The question is whether the impersonate writer of the letter or diary is real one or not? In recent years in case of autobiographies, this has become a growing problem because of rising of 'ghost' writers in the market. But the same is also plausible true to other documents also.

While discussing credibility of the document, Scott (1990) reported two major concerns with respect to personal documents.

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One is the factual accuracy of reports and other is whether they really report the true feelings of the writer? Scott recommended that healthy scepticism should be there while judging the credibility of any document. Similar caution should be used while dealing with the analysis of letter and other personal documents.

The third criterion representativeness is also a major concern while analyzing document materials. In earlier times literacy was very less. People belonging to higher strata were literate only. The letters, diaries and autobiographies are likely to be preserve of these literate people. At that time also males were found more educated than females therefore, voice of women is under – represented in old documents. Therefore, such historical documents are likely to be biased in terms of authorship. Then survival of the letters is another issue as no one knows what proportion of letters get damaged, lost or thrown away?

The next criterion of meaning of personal document is usually get influenced by the damage to letters, diaries and the use of abbreviations or codes by the authors of that document, because of which there is always some problem in interpreting & understanding the information lying in that.

Visual Objects (Photographs)

Now a days there is a growing interest of social researchers in the visual objects and photographs are the most obvious manifestation of this trend. Photographs may have multiple roles in social research. These could be the focus of content analysis or might be used as prompts in connection with interviewing or can become a part of an experiment. There is an important difference between the use of extant photographs (not produced for the research) and research generated photographs (produced by the researcher or at the request of researcher). Photographs play three major roles :

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Illustration

Photographs give detailed illustration to a point which otherwise might be a dry discussion of finding. In ethnography photographs are prominently used by anthropologists.

As Data

Photographs may work as data in its own way. In research generated photographs they become essential part of researcher's field notes. On the other hand in case of extant photographs they are the main source of data about the field in which researcher is interested.

As Prompts

Photographs can be used as prompts/clues to attract people to talk about what they see in them. Both type of photographs, research driven and extant can be used for this purpose. Visual images that are research driven may be taken by the researcher or the research participants can be used as a basis for photo elicitation. Therefore, researcher uses the images as a springboard for discussions concerning images and significance of these images in the research pursuit.

Scott (1990) categorized home photographs into three types:-

Idealization

It is a formal pose for eg. a wedding photograph or a family photograph.

Natural Portrayal

It means capturing actions as they happens, although there may be an artificial element in that.

Demystification

It means capturing an image of the subject in an untypical (embarrassing) situation.

Scott (1990) was of the view that a researcher should be aware of these different types of photographs exclusively while dealing with research endeavours so that not only superficial but beneath the surface probe can be made. Because there are the

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chances that there may be a void between the photographic image and underlying reality.

Official Documents

These are further of two types

(i) Official Documents from State / Government Sector

(ii) Official Documents from Private Sector

Official Documents from State / Government Sector

Government Sector is the great source of significant information for a social researcher. It provides statistical information, textual material such as Acts of parliament and official reports etc. Abraham (1994) in his research on the medical drug Opren was concerned with the role of interests and values in scientists' evaluations of the safety of medicines. For this purpose he used publically available transcripts of the testimonials of scientists, in which some were employed in manufacture of Opren, Parliamentary debates, questions and answers in Hansard (Report of British parliament), and leaflets, letters, consultation papers and other documents minded by British regulatory authority in respect of its duties under the 1968 British medicines Act'(p.-720). The analysis of the report in the study revealed certain inconsistencies which exist in the testimonies of scientists'. This suggests that interests play an important role in such situations.

As per Scott (1990) criterion analysis these materials are certainly authentic and have meaning as are clear & understandable to the researcher. But the credibility criterion raises the issue of whether the documentary source is biased. Therefore, one should be cautious while treating materials to depict reality associated with them. The criterion of representativeness is complicated in this case as their official or quasi official character makes them unique in qualitative research as in this research no case can be representative in a statistical sense.

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Official Documents from Private Sector

This includes heterogeneous sources but usually includes company/organization documents as a source. Public domain documents of companies are annual reports, mission statements, press releases, advertisements, public relations material and so on. Whereas, organizational charts, newsletters, minutes of meetings, memos, internal & external correspondence etc. are not of public domain and are mainly used by ethnographers in their investigations. But to get access to these documents of organizations is difficult. Researchers usually rely on the public domain sources only. Documents derived from private sources are likely to be authentic and meaningful if they are clear and easy to comprehend by the researcher. Scott (1990) suggested that documents cannot be regarded as providing objective information. They have to be interrogated and examined in the context of other sources of data also. For example through documents different members of organization expressed their perspective that reflected their positions in the organization. Therefore, only authors of the documents could confirm the content of those documents and their authenticity.

The criterion of representativeness can be met if the researcher has access to the comprehensive set of documents. Sometimes there are chances that some had destroyed certain documents or sometimes there is no easy access to certain sensitive documents. So, it can't be said that these documents exists but doubts will be there whenever there will be uncertainty about the representativeness of these document sources of private sector.

Mass Media

Magazines, newspapers, television programmes, films, radio, advertising and so forth are the sources for social scientific research analysis. The content analysis of any news in editorials and articles by specialists in different newspapers vary to a great extent. In the same manner content of specific themes give varied aspects in

different magazines. Same is with films also. There is always a shift in sensitivity, nature and emphasis in films on same theme.

There is difficulty in ascertaining the authenticity issue in mass media sources. While these sources deemed to be genuine as authorship of articles is usually unclear in editorials etc., so it is difficult to know, whether to rely upon the article as is written by someone in a position to give accurate information. Representativeness of analysis of newspaper or magazine articles is not an issue as the corpus from which an example has been drawn is usually ascertainable when wide range of newspapers are engaged.

Virtual Documents

The documents that appear on the internet are known as virtual documents. Its vastness and easy accessibility make it a source of data for qualitative & quantitative data analysis. There are two types of virtual document-

I. Websites
II. Internet postings to message boards.

As an example of websites as source of data Alridge (1998) in a study examined written consumer guides and several internet websites and extracted various themes which he found as a part of the 'promotional culture'. He was of the view that it is necessary for the public to assume responsibility of their personal finances in the light of professional client relationship and reductions in welfare provisions.

So, as far as authenticity is concerned website can be setup by any person, and in the light of above research example the financial advice may be given by any person who is not an authority. Regarding credibility of websites one must be aware of the possible distortions as the information can be manipulated. Representativeness of websites is also questionable on a certain topic. Without considerable knowledge it is difficult to comprehend what is showing on the website. Whether the website is the original one or is some fake site. There are certain problems for social

researchers in this context as the sites are always in the state of metamorphosis. The crucial issue is to be sensitive to the limitations of the use of websites as material that can be content analyzed. Therefore, using both printed and website materials give contrasting results and provide basis for cross-validating the sources. Like analyzing other documents same sceptical method should be used while analyzing website materials.

Conclusion

In social research document analysis is of immense importance in methodological and data triangulation. It is a standalone method for specialized forms of qualitative research. For the studies which are designed within an interpretive paradigm documents can be the only necessary data source. In case of historical and cross cultural research it may be the only viable source. In other types of research, the investigator should avoid over-reliance on documents. Analysis of document is a low-cost mean to obtain empirical data. It is a modest and non-reactive process where researcher needs to determine not only the existence and accessibility but also the authenticity and usefulness of document. It takes into account the original purpose of each document, the intended audience as well as the context in which it was produced. In the process of analysis of any document it is necessary that social researcher should analyse the document more rigorously so as to elicit as more transparent information as possible.

References

Abraham, J. (1994). Bias in Science and Medical Knowledge: The Opren Controversy', Sociology, 28:717-36.

Aldridge, A. (1998). Reproducing the value of Professional expertise in Post-Traditional Culture: Financial Advise and the creation of the client'. Cultural Values, 2:445-62.

Atkinson, P. A. & Coffey, A. (1997). Analysing documentary realities. In D. Silverman (Ed.), Qualitative research: Theory, method and practice London: Sage. pp.- 47

Bowen, Glenn A., (2009). 'Document Analysis as a Qualitative Research Method', Qualitative Research Journal, vol. 9(2), pp. 27-40.

Bryman, A. (2008). Social Research methods. Oxford University Press, pp. 515-525

Clandinin, D. J., & Connelly F. M., (1998). Personal experience methods. In N. K. Denzin & Y. S. Lincoln (Eds.), Collecting and interpreting qualitative materials. Thousand Oaks, CA: Sage.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (1998). Collecting and interpreting qualitative materials. Thousand Oaks, CA: Sage.

Kralik, D., Koch, T., & Brady, B. M. (2000). Pen pals: Correspondence as a method for data generation in qualitative research. Journal of Advanced Nursing, 31, 909-917.

Scott, J. (1990). A Matter of Record (Cambridge: Polity), p. 6

Wild, P. J., McMahon, C., Darlington, M., Liu, S. & Culley, S. (2009). A diary study of information needs and document usage in the engineering domain. Design Studies. Vol. 31(1), 46-73

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Research in the Chemistry and It's Utility For Socicty

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Abstract

Research in the field of chemistry plays important role for the betterment of the society. It helps in the better knowledge for selection of substances which is used by the society for its day by day activities. Chemical nature of the food material, agriculture and its related material, medicine, building construction material, cloths forming materials help in effectiveness of these materials toward betterment of society. The research in food chemistry plays an important role in choosing the healthy food for different geographically isolated society. The research in agricultural chemistry plays a huge role in increasing the food production. The research in the field of medicine helps in development of many drugs and medicine for helping the society to be healthy and disease free. The research in the field of construction material helps in selecting the constriction material for constructing the building for various climate zones. Fabrics related researches help in developing the better quality cloths for society.

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Introduction

Research in the field of chemistry is very important for the betterment of the society. The whole world is made up of two things- 1.Matter and 2.Energy.The smallest unit of the matter is atom and these atoms combined to give molecules. The study of atoms and molecules and their interchange from one type into other type by means of chemicals changes is done under the branch of science, known as Chemistry. The research in chemistry develops the knowledge of chemicals. The chemical may be natural or synthetic bases on their occurrence. In nature chemicals are present in the air, water, soil, food etc. Synthetic chemical are synthesize in the laboratory by various methods and are very useful to the society. Many chemicals are used in improving the quality of life and most of them are not harmful for the living being. However some chemical have the potential to cause harm when taken in excess amount. The application of chemistry has very broad scientific field as its relevance is seen in almost in every aspect of society like medicine, food, agriculture, environmental process, manufacturing of goods, clothes, soaps, oil and many more useful material. Discussion on some of these is given here.

Discussion

The food is a substance which provides nutritional support for a living organism. It is very essential as it contains various substances which perform important function of the body of living organism. The food substance is composed of many small units like carbohydrate, protein, vitamins, minerals, water and others. All these are made up of different chemicals. Food also contains other natural occurring chemicals like antioxidant, antimycotic, buffers, thickeners, emulsifiers, chelating agent, colors and flavors. Some time synthetic chemical also added to the food to enhance flavor, appearance or texture of a food product. Some chemicals help to preserve the food so it can be enhance the shelf life of the food. Some examples of the

synthetic chemicals present in food are Methyl cyclopropene, Mono Sodium glutamate, Erythromycin or Red -3, Sodium nitrate, Guar gum, High Fructose corn syrup, Aspartame, Scuralose, Saccharine, Sodium benzoate, Xanthus gum, Sodium chloride, BHA, BHT, Potassium bromide, These synthetic chemicals in-take in large amount may also have adverse effect on the body of living organism. We should avoid consumption of such food which contains large quantity of synthetic chemical in it.

Chemical nature of food helps to understand the nutritional value and composition of food. This will help in the selection of food which should be given to a particular society. If the population of any geographical area is using the vitamins deficient food for a long time the population of this area become prone to the disease caused by deficiency of this particular vitamin. The research helps to overcome this problem by suggesting for giving the appropriate dose of that particular vitamin.

In the field of agriculture the chemical researcher develops a number of fertilizers. Fertilizer is a substance of natural or synthetic origin that is applied to soils or to plant tissues to supply one or more nutrient essential for the proper growth of plants. The example of some synthetic fertilizers are urea, DAP, TSP, Ammonium nitrate etc. These fertilizers help to increase the food production drastically therefore they help society to overcome the food and energy demand. Alongside the use of fertilizers, the use of pesticides and antibiotics also plays an important role in the production of crops. The pesticides are the chemicals which are used to get rid of pests or microbes without harming the crop to be cultivated. Some example of pesticides are DDT (dichloro–diphenyl-trichloroethane), DDE, Aldrin, Endrin, Heptachlor, BHC (benzene hexa-chloride), etc.. These pesticides are Organic or Inorganic in nature. The modes of action of these chemicals are based on the mode of the attack on the pest's biological system. The research in chemistry are able to understand the nature of chemicals present in these pesticides and there mode of

action on the pest's biological activity. This helps in development of those kinds of pesticides which are more effective so the small quantity is needed and hence it benefits to the agricultural sector. Antibiotics are also used in the agricultural sector as these help in cure of bacterial infection in the animals associated with this sector. Antibiotics, also called antibacterial, are medicine or drugs that destroy or slow down the growth of bacteria when given to the living organism. Some examples of antibiotics are amoxicillin, doxycycline, cephalexin, metrondazole, azitromycin, sulphamethoxazole, trimethiporium etc. In polatry farming antibiotics are used on broad scale as these antibiotics helps the chicken to fight against bacterial infection thus polatry farming industry uses the antibiotics to increase the meat production.

In the field of medical chemistry researchers synthesized a no of medicine and drugs. A drug is a substance that causes a change in an organism's physiology or psychology when consumed. A medicine is a type of drug used to treat, cure, prevent, or diagnose a disease to promote well being of a living organism. Some commonly used medicines are paracitamol, ibuprofen, alpazolam, amoxyllein, bacterium, benzapril, cough syrup, codex etc. The no of medicine commonly prescribed by doctors in USA is more the 240000. These medicine help to the society as these are able to diagnose, cure, treatment and prevention of disease in society. In ancients time many people dies because of many infectious disease. The discovery of antibiotics and other supportive medicine decrease the rate of mortality drastically in case of infectious disease. Now a day's chemists are focusing on the research work on the carcinogenic medicine and drugs so the treatment of cancer becomes effective, cheap and in the reach of the every segment of the society. This type of research surely will benefit the society by making it disease free and healthy.

Research in chemistry also plays a huge role in society with relation to shelter. Shelter is a basic structure or building that provides

protection from the local environmental conditions. By knowing the chemical composition and structure and properties like density, reflectivity, adhesiveness, viscosity and thermal properties of material which is used in construction of building helps in selection of construction material for different type of building constructed for different environmental conditions. The research in this field helps to construct high performance buildings. Chemists come up with the new type of paints and epoxy sprays that protect building from the wear and tears inflicted by rain, sunlight, wind, pollution, heat .The space age coating and paints are designed in a way that the properties looks better, perform better and last for long period. Thermo chemical substances may protect the rooftops and also help building to stay at the optimum temperature. The research in chemistry proven to reduce energy and cost to create a more comfortable building for use as a private residence, government building, and business headquarter and for many other purpose. These construction materials also help in construction of fly-over, road and many basic infrastructures.

Chemists who work on creating fabrics that offer special, strain resistant properties are also designing ,kind of fabrics, that come out strain and wrinkle free from the washing and the drier. These types of fabrics are reducing the amount of time and money and energy to take care of the clothes. These fabrics are also helping in the protection of the environment by minimizing the use of dry-cleaners and many other chemicals which are harmful to the environment. Strain resistant fabrics contain a coating will make them easier to clean. Today chemistry is revolutionizing the way a society wears and takes care of the clothing.

Conclusion

Literature survey, lab work, analysis and experiment associated with research in chemistry field make chemical and technological advancement that benefits the society and contribute to its betterment. The research in chemistry has the vital role for the

society. This chemistry researcher improves the living condition of the society with their achievements and high thinking.

References

1. *https://prezi.com/zhh7-2mu88pn/what-is-the-difference-between-natural-and-synthetic-chemicals/ accessed on 05.09.2018.*
2. *Fennema, O.R., Ed. (1985). Food Chemistry - Second Edition, Revised and Expanded. New York: Marcel Dekker, Inc.*
3. *John M. de Man. 2009. Food process engineering and technology, Academic Press, Elsevier: London and New York, 1st edn.*
4. *Heinrich W. Scherer. "Fertilizers" in Ullmann's Encyclopedia of Industrial Chemistry. 2000, Wiley-VCH, Weinheim.*
5. "Basic Information about Pesticide Ingredients". US Environmental Protection Agency. Apr 2, 2018. *Retrieved Dec 1, 2018*.
6. "Drug". Dictionary.com Unabridged. v 1.1. Random House. 20 September 2007. Archived from the original on 14 September 2007 – via Dictionary.com.
7. *"Building" def. 2 and 4, "material" def. 1. Oxford English Dictionary Second Edition on CD-ROM (v. 4.0)© Oxford University Press 2009*
8. "Cloth". Merriam-Webster. Archived from the original on 2012-06-06. *Retrieved 2019-08-25*.

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Introduction To Research Data And Its Visualization Using R

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Abstract

Today's researchers, business organizers depend upon facts and figures. It has been frequently observed that a vast amount of data surrounds them. Data is treated as a raw material of any research, business, or any other developmental activates. Currently, data has become an essential component of businesses, industries, research organizations, and technological development. We are living in an era of Big data. The volume of data used is rapidly growing every second. Data visualization helps people to the recognized significance of data by summarizing and presenting simply. Data visualization is a process to describe massive data in an accessible, understandable, and straightforward format. *A researcher must* understand the importance of data visualization and its relationship to research. In the present chapter, we introduce data and visualization of data, and also providing some techniques for visualization of data using statistical software R.

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Introduction

Data

Singh, Y.K. (2008) suggested a definition of data as "Data means observations or evidence." Elmasri R, Navathe S.B. (2008) described as "Data known facts that can be recorded and that have implicit meaning." Webopdia defined as "Data is distinct pieces of information." Wikipedia defined " Data as a set of values of subjects concerning qualitative or quantitative variables." Maths-is-fun defined as "a collection of facts, such as numbers, words, measurements, observations, or even just descriptions of things."

Data is/are the raw and unorganized facts of the world. When data is/are processed, organized, structured, or in any presented form for some context, useful, it is called information. The knowledge is a personal map/model of information. The data type can be grouped into two major categories, qualitative data, and quantitative data. Qualitative data, which has a numerical value, cannot be assigned, e.g., motivation, confidence. Quantitative data, which has a numerical value, can be assigned, e.g., height, weight, speed. Qualitative data further divided into ordinal and nominal values and quantitative data divided into continuous and discrete values.

A continuous variable is a category of the quantitative variable for which fractional value exits, e.g., age, weight. A discrete variable is a category of the quantitative variable for those value exist only in units, e.g., 30 boys, 25 girls, 40 Indian. A nominal variable is a category of qualitative data for the classified item into two or more categories, no particular order assigned to them, e.g., pass and fails, rural and urban. Ordinal is a category of classified items into two or more categories, a logical order assigned to them, e.g., A grade, B grade, C grade, Ist position, IInd position, IIIrd position.

The data collection is an essential task of research & development responsibilities. The task of data collection begins after a research problem has been defined. For the study, the data has two basic types viz., primary data, and secondary data. The primary data is data that is collected by a researcher from first-hand sources, using some methods, e.g., observation, interview, through questionnaires,

through schedules, audits, mechanical devices, surveys, experiments. Secondary data refers to data which are collected by others for their purpose. Some natural sources of secondary data are data for social networking data, censuses, information collected by government departments, and organizational records.

A data model is a logical inter-relationships and data flow between different data elements that are involved in building an information system. It is also a documentation way of storing and retrieving. Data models help represent what data is required, and what format is to be used for business or scientific processes.

A most general sense the database is an organized collection of data. The database is a method of storing, managing, and retrieving information. The database is a collection of related data. A Database Management System (DBMS) is a collection of programs that enables users to create and maintain a database. A Database Management System (DBMS) is an application software package designed to define, manipulate, retrieve, and manage data in a database. DBMS has belonged to an application software category, e.g., Oracle, MS SQL Server, FoxPro, dBase, MS Access, MySQL. A Relational DBMS is a computer program for managing data in a database, has three major parts: Data is present as a table, Operators for manipulation tables, Integrity rules on the table. The database system based on the relational model specified by E. F. Codd (1970) is known as the Relational Database Management System (RDBMS).

Data Visualization

Embarak O. (2018) described that data visualization is the process of interpreting data and presenting it in a pictorial or graphical format. Data visualization helps the audience to understand the significance of data by some methods, e.g., summarizing and presenting. Another role of Data visualization is a process to describe massive data in an accessible, understandable, and straightforward format. Data visualization is a method to communicate the information clearly and effectively. The enormous growth of data, it has become difficult for research and business organization to extract crucial information from available data. The research and business

organization collect massive data because of analyzing that data capable of making critical business decisions. Arockia Panimalar et al. (2017) and Dev Tandon (2019), suggested some importance of data visualization

1. Data visualization of data absorb information quickly, save time
2. Data visualization helps to understand next steps of business or research, help for decision making
3. The focus of data visualization to show the relationships between business conditions
4. Data visualization has developed an interest in the audience
5. Data visualization creates data more accessible and less confusing
6. Data visualization makes data more shareable.
7. Data visualization quickly reveals the outliers in data.
8. Data visualization helps to remember and memorize a concept of research and business conditions
9. Data visualization allows making decisions faster
10. Data visualization helps to review strategies quickly and efficiently

The approach for successful data visualization is given Dev Tandon(2019).

1. Data visualization should tell a visual story
2. Data visualization easy to understand
3. Data visualized according to the target audience.
4. Data visualization answers specific questions
5. Data visualization can be quickly and easily updated with new data
6. Data visualizations typically help professionals to improve their strategies.
7. Data visualization is honestly represented what is going in research or business
8. Avoid information overload. the aim of data visualization is simplicity

9. It does not require an IT expert or specific tool, typical sales, marketing, or finance professional should be able to build data visualizations with their data and own tool.

Software R

R is a software environment with a programming language most commonly used for statistical computing and machine learning. It is maintaining by the R Foundation. In 1993, R was developed by Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand. Now R is available as open-source software. R possesses an extensive catalog of statistical and graphical methods. R is not only entrusted by academics, even some reputed business organizations, including Uber, Google, Airbnb, Facebook, also use. The scientific community has also recognized computation using R. The enormous help and reference resources of R available on the internet.

Data Visualization Using R

Matthew N. O. Sadiku et al. (2016) explained some visualization techniques, e.g., line, pie, bar, and scatter with the application, and challenges of data visualization. The term variate has played an essential role in statistical analysis and data visualization. In contradistinction to a variable, a variate is a quantity which may take any of the values of a specified set with a specified relative frequency or probability. The quantification is the process of assigning numeral values to a variable, and the quantified variable is known as variate. Some statistical analysis is termed with word variate with the prefix, e.g., uni, bi, or multi. The univariate analysis is based upon quantified variables with numeral values one.

Similarly, analysis quantified with two is known as the bivariate analysis. More than two quantified is known as multivariate analysis. Table-1 represents the visualization tools for univariate analysis. Table-2 represents the visualization tools for bivariate analysis.

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Table-1 Visualization of Univariate Analysis

Data Type	Visualization Tool
Qualitative data	Bar, Pie
Quantities data	Box plot, Histogram

Table-2 Visualization of Bivariate Analysis

Data Type	Visualization Tool
Qualitative v/s Qualitative	Mosaic plot
Qualitative v/s Quantitative	Box Plot
Quantitative v/s Quantitative	Scatter plot, Line linear, Non linear plots

Example

Dataset *mtcars* in R, extracted from the 1974 *Motor Trend* US magazine, and comprises fuel consumption and ten aspects of automobile design and performance for 32 automobiles (1973–74 models). A sample view of data shown in Figure-1.

Table-3: Description of *mtcars* dataset

Attribute	Description	Data type
mpg	Miles/(US) gallon	quantitative
cyl	Number of cylinders	qualitative
disp	Displacement (cu.in.)	quantitative
hp	Gross horsepower	quantitative
drat	Rear-axle ratio	quantitative
wt	Weight (1000 lbs)	quantitative
qsec	1/4 mile time	quantitative
vs	Engine (0 = V-shaped, 1 = straight)	qualitative
am	Transmission (0 = automatic, 1 = manual)	qualitative
gear	Number of forwarding gears	qualitative
carb	Number of carburetors	Qualitative

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Figure-1 Some Observations of *mtcars* dataset

```
> mtcars
                   mpg cyl  disp  hp drat    wt  qsec vs am gear carb
Mazda RX4         21.0   6 160.0 110 3.90 2.620 16.46  0  1    4    4
Mazda RX4 Wag     21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
Datsun 710        22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
Hornet 4 Drive    21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
Hornet Sportabout 18.7   8 360.0 175 3.15 3.440 17.02  0  0    3    2
Valiant           18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
Duster 360        14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
Merc 240D         24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
Merc 230          22.8   4 140.8  95 3.92 3.150 22.90  1  0    4    2
Merc 280          19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
Merc 280C         17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    4
Merc 450SE        16.4   8 275.8 180 3.07 4.070 17.40  0  0    3    3
Merc 450SL        17.3   8 275.8 180 3.07 3.730 17.60  0  0    3    3
Merc 450SLC       15.2   8 275.8 180 3.07 3.780 18.00  0  0    3    3
Cadillac Fleetwood 10.4  8 472.0 205 2.93 5.250 17.98  0  0    3    4
Lincoln Continental 10.4 8 460.0 215 3.00 5.424 17.82  0  0    3    4
Chrysler Imperial 14.7   8 440.0 230 3.23 5.345 17.42  0  0    3    4
Fiat 128          32.4   4  78.7  66 4.08 2.200 19.47  1  1    4    1
Honda Civic       30.4   4  75.7  52 4.93 1.615 18.52  1  1    4    2
Toyota Corolla    33.9   4  71.1  65 4.22 1.835 19.90  1  1    4    1
Toyota Corona     21.5   4 120.1  97 3.70 2.465 20.01  1  0    3    1
Dodge Challenger  15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
```

Bar Plot

A bar plot is a plot that presents qualitative data with rectangular bars with lengths proportional to the values that they represent. A bar plot uses to make comparisons among discrete categories.

Bar plot based on frequencies to create bar plot two steps required in R first to create a frequency vector and use frequency vector in a bar plot function. *crab* attribute in the dataset *mtcars* is a qualitative data type. Following commands are used to create a bar plot using R. In Figure 2 is shown bar plot.

```
> freq=table(mtcars$carb)
> barplot(freq)
```

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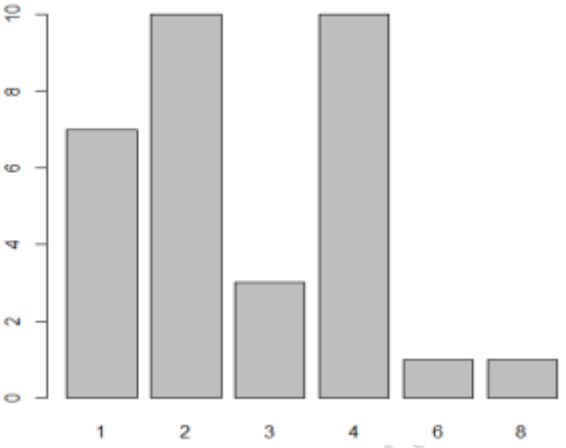
Figure-2 Bar plot

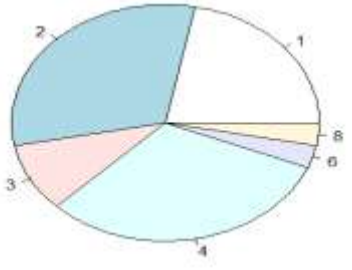


Pie Diagram

A pie diagram is a circular diagram divided into sectors, illustrating proportion. In a pie diagram, the arc length of each sector is proportional to the quantity it represents. Pie diagram based on frequencies to create Pie diagram two steps required in R first to create a frequency vector and use frequency vector in a pie function. *crab* attribute in the dataset *mtcars* is a qualitative data type. The following commands are used to create a Pie diagram using R. In figure 3 is shown Pie diagram.

```
> freq=table(mtcars$carb)
> pie(freq)
```

Figure-3 Pie diagram



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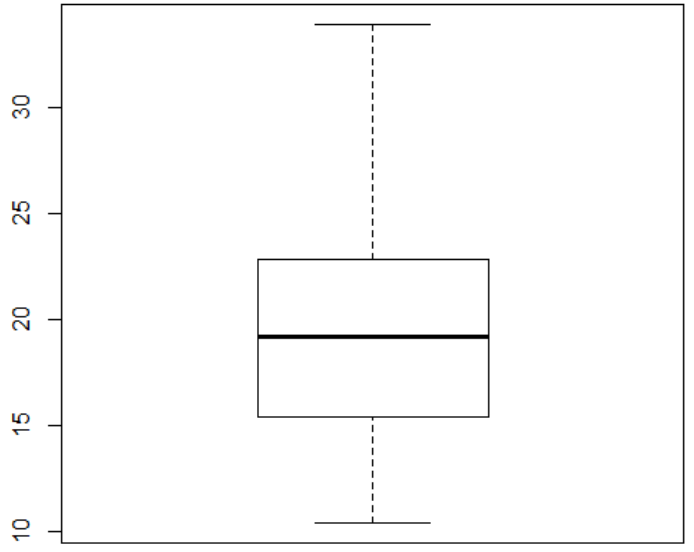
Box Plot

A box plot is a standardized way of displaying the distribution of data based on a five-number summary (minimum, first quartile (Q1), median, third quartile (Q3), and maximum).Box plot based on quantitative data. Attribute *mpg* in data set *mtcars* is quantitative. Following R command is used to create a box plot. Figure 4 is shown the box plot of *mpg*.

```
> boxplot(mtcars$mpg)
```

Figure- 4 Box plot



Histogram

A histogram is a graphical display of data using bars of different heights. In a histogram, each bar group numbers into ranges of quantitative data. Following R command is used to create a histogram. Figure 5 is shown the histogram of *mpg*.

```
> hist(mtcars$mpg, right=F)
```

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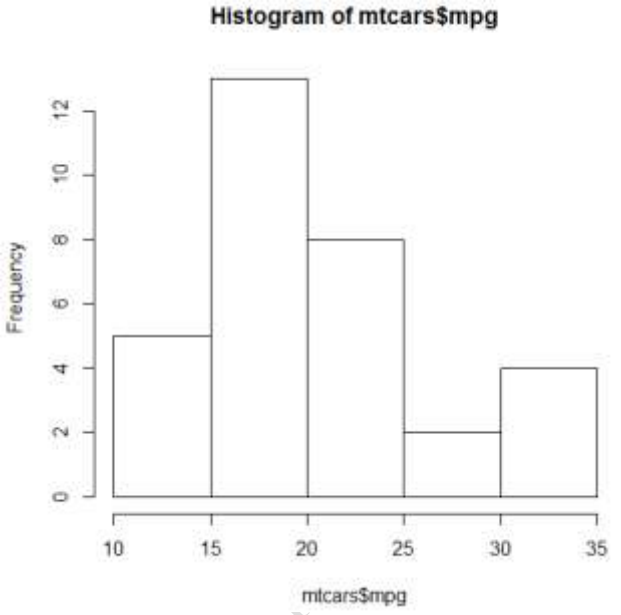
Figure-5 Histogram



Mosaic Plot

A mosaic plot is a graphical method for visualizing data from two or more qualitative variables. It gives an overview of the data and makes it possible to recognize relationships between different variables. Attributes carb and gear are qualitative types. To create mosaic plot R commands as given. Figure 5 is shown in the Mosaic plot.

```
> mosaicplot(~ gear + carb, data = mtcars, color = 2:3, las = 1)
```

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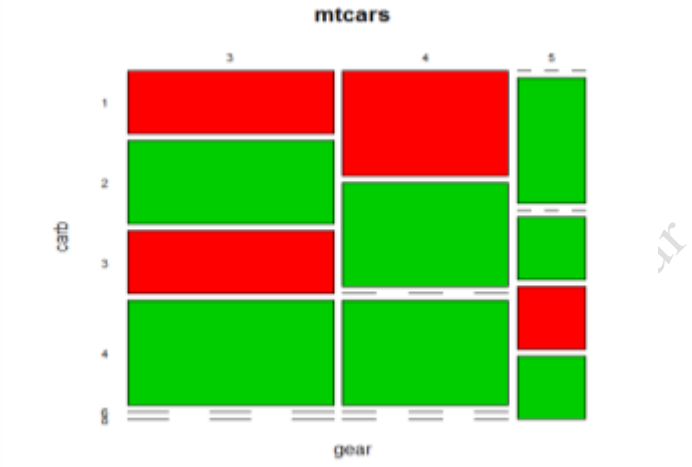
Figure-6 Mosaic Plot

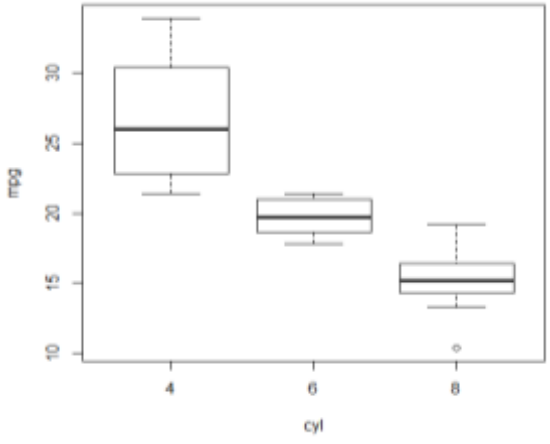


Box Plot (Bivariate)

Box plot (bivariate) is also used to draw plot quantitative v/s qualitative data. In *mtcars* dataset, the data type of attribute *mpg* is quantitative, and the *cyl* is qualitative. R command to create a box plot is below. Figure 7 is shown in the bivariate box plot.

```
> boxplot(mpg~cyl,data=mtcars)
```

Figure -7 Bivariate Box Plot



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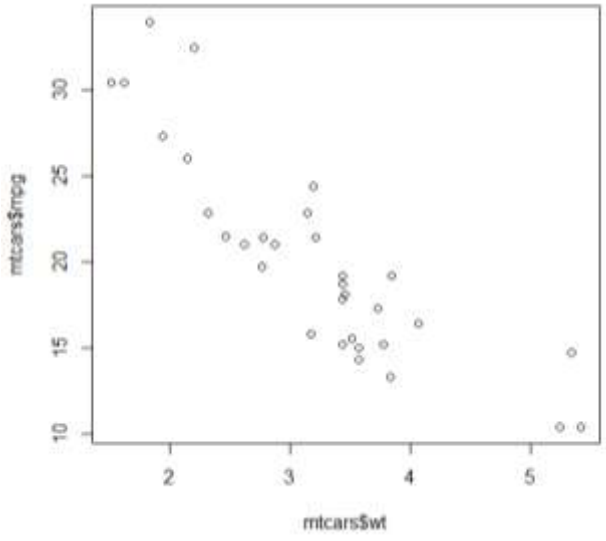
Scatter Plot

A scatter plot, also known as a scatter graph or a Scatter chart, is a two-dimensional data visualization that uses dots to represent the values obtained for two different variables - one plotted along the x-axis and the other plotted along the y-axis. The R command to create a scatter plot is as below. Figure 8 is shown in the scatter plot.

```
> plot(mtcars$wt,mtcars$mpg)
```

Figure-8 Scatter Plot

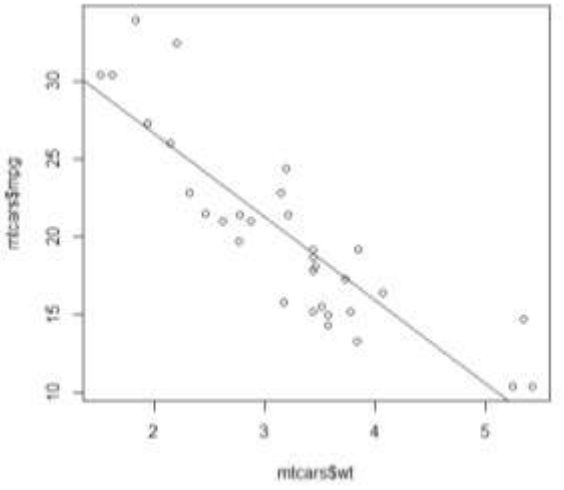


Line Plot

A *line* chart or *line* plot or *curve* chart is a type of chart that displays information as a series of *data* points called 'markers' connected by straight *line* segments. The R command to create a line plot is as below. Figure 9 is shown in the line plot.

```
>plot(mtcars$wt,mtcars$mpg)
>abline(lm(mpg~wt, data=mtcars))
```

Figure-9 Line Plot



Scatter Matrix

Scatter matrix is a multivariate plot; it is scattered plots of all possible combinations in a data set. The R command to create a scatter matrix is as below. Figure 10 is shown in the scatter matrix plot.

>pairs(mtcars)

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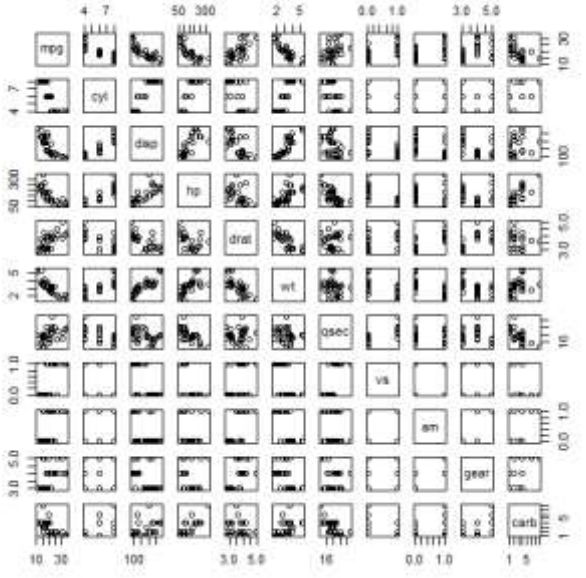
Figure-10 Scatter Matrix



Conclusion

In the present chapter, we discussed data and data visualizations. The chapter covers the fundamentals of data, data nature, data collection, data model, database, database management system, variate, and some necessary graphical tools. R is a potent statistical computation tool, all the computation of chapter conducted by using R. We also explain R some visualizations with the help of examples.

Reference

1. *Arockia Panimalar.S, Komal M.Khule, Karthika.S, Nirmala Kumari.T (2017). Data Visualization Tools and Techniques For Datasets In Big Data International Research Journal of Engineering and Technology (IRJET), Vol 4(8), pp1667:1672.*
2. *Dev Tandon https://thekinigroup.com/importance-data-visualization/*

3. *Elmasri R., Navathe S.B. (2008). Fundamentals of Database Systems. Peason Education, Inc.*
4. *Embarak O. (2018) The Importance of Data Visualization in Business Intelligence. In: Data Analysis and Visualization Using Python. Apress, Berkeley, CA*
5. *Gupta S.P. & Gupta M.P. (2009). Business Statistics. Sultan Chand & Sons, New Delhi.*
6. *http://www.infogineering.net/data-information-knowledge.htm*
7. *Kothari, Garg (2014). Research Methodology Methods and Techniques. New Age International (P) Limited, Publishers., New Delhi.*
8. *Matthew N. O. Sadiku, Adebowale E. Shadare, Sarhan M. Musa, and Cajetan M. Akujuobi (2016). DATA VISUALIZATION. International Journal of Engineering Research And Advanced Technology Volume. 02 Issue.12 December– 2016, pp 11:16.*
9. *Pant M.M. (2001). Information system Development, CIC study material of IGNOU, New Delhi.*
10. *Rajput R S (2019). Introduction to R. 10.13140/RG.2.2.11354.80329*
11. *Rumbaugh J. et al. (2003). Object-Oriented Modeling and Design. Prentice-Hall of India Private Limited, New Delhi.*
12. *Singh Yogesh Kumar. (2008). Fundamental of Research Methodology and Statistics. New Age International (P) Limited, Publishers, New Delhi.*
13. *The R Project for Statistical Computing Retrieved from https://www.r-project.org/*
14. *Variate-Glossary of statistical term retrieved from https://stats.oecd.org/glossary/detail.asp?ID=3886*

Writing Qualitative Research Paper
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Designing Research Strategy

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Two fundamental problems that a Researcher has to face at the initial stage of undertaking an investigation are-

1. Formulation of Research problem and,
2. Designing research Strategy

An appropriate information and knowledge of these problems can avoid deviations regarding relevant Data collection and deriving scientific generalizations. The objective of the current discourse is to discuss the needs and significance of research design in the social sciences discipline. Designing strategy before undertaking an enterprise is key to success of an objective. It provides not only an insight or vision for the work but also induces knowledge for an appropriate use of resource material. Skill and technique to utilize the available resources help to overcome difficulties and confusions thus leading to an outcome or generalization of worth. At the initial stage of study a research scholar has to cope with a number of issues regarding-

1. How to formulate a problem?
2. How to organize a research activity?
3. How to collect reliable Data?
4. How to come to a generalization?

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Research is a scientific plan involving a careful and exhaustive investigation with an objective of advancing knowledge, an objective attempt of studying a problem and deriving general principles. Scientific plan is building of a body of scientific knowledge through observation, experimentation, experimentation, generalization and verification (Theodorson and Theodorson 1969). Objectivity, accuracy, systematization and scientific method of Data Collection is key to a research activity.Validity of research depends solely on the methods of data collection and reliability of findings. Undertaking a research activity therefore needs a planning of enquiry and a detailed strategy of how the research will be conducted and reliability and validity of research be ensured. A carefully well designed Research strategy before taking decisions can be helpful to overcome many problems during tenure of research two essential questions to be probed in a research are-

1. First, what a researcher desires to find out i.e; how he introduces the problem of investigation or structures the issues to be studied logically?
2. Second, to determine how the research undertaking has to be carried out through scientific and appropriate manner i.e; what methods of data collection and data analysis be application in getting upto reliable and meaningful deduction. The fundamental problem for a research scholar is the task of properly posing a research problem or logical structuring of a Design. Designing Research Strategy i.e; "Research design" is thus a key issue for any research undertaking.

What is a Research Design?

Research Design is a systematic plan to study a scientific problem. The Design defines the study types and sub-types,

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research questions, hypothesis, dependent and independent variables. Design can be described 'as paradigm, an essential collection of beliefs shared by scientists, a set of agreements about how the problems are to be understood? How we view the world and thus go about in conducting research. Paradigms contain a basic set of beliefs or assumptions that guide our enquiries for a particular research (Creswell 2003). "For defining a valid research the most recommended method is to follow a paradigm. This is specific because by selecting a paradigm researcher does not dwell in his own philosophical know-how and get a better stance chosen to other alternatives" (Myers and Avison 2002). Design is an outline, a plan, systematic arrangement of activities to be followed during a research project or a research undertaking. It is a decision or a process concerned with making controlled scientific inquiry of a problem, an strategy planning before conducting research. It Plans as to-

1. What is to be observed?
2. How is to be observed?
3. When or where is to be observed?
4. Why it is to be observed?
5. How the observations be recorded?
6. How to Collect, analyze and interpret observations?
7. How to come to a Generalization?

"A research Design is arrangement of Conditions for Collection and analysis of Data in a manner that aims to combine relevance to the research purpose with economy in procedure". It is a process of making decisions before the situation arises in which the decisions has to be carried out. It is a logical strategy of conducting research.

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Research design not only anticipates and specify the seemly countless decisions connected with Data Collection, processing and analysis but it presents logical basis of these decisions (Herry Manhiem 1977)

Research design is defined as a master plan specifying methods and procedures for collecting and analyzing the needed information (Zikmund 1962).

Research design is concerned with 'specification of the Problem, conceptual definitions, derivation of Hypothesis to test, and defining the population to be studied'

"Research design is plaaning various phases and procedures relating to the formulation of research efforts.....an arrangement of essential conditions for collection and analysis of datain a form that aims at combiningrelevance to research purposewith economy in Procedure" (Acoff Russel 1961)

The planned sequence of the entire process involved in conducting a research activity (Miller 1991)

Research design involves a plan or an structure of a investigation of a problem to be probed and answered

Objectives of Research design

Research is an exhaustive attempt to probe a few questions in the mind of a researcher. At the initial stage of research operation a number of questions arise in the mind of a researcher such as-

How to organize the research activity?

How to choose samples desired for Data collection?

What methods should be applied for Data Collection?

How to derive Hypothesis and what methods should be applied for hypothesis testing?

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How much time and money will the research undertaking take?

Systematic strategy and planning may answer all these questions. Any Research operation needs better organization of data collected and contents in hand. Clarity of objectives, statement of the source of information relevant to the research problem, specification of the procedures and techniques for gathering Data, application of appropriate methodology, estimate of time and budget to be consumed and systematic application of resources can be of great worth in smooth research operation. An efficient and appropriate research design does not only facilitate the researcher to conduct the research operation in a smooth manner but it has also a great bearing on the reliability of generalizations without any flaw and inadequacies.

Black and Champion (1976) has suggested three important functions of a research design-

1. It provides a blue print
2. It Dictates the boundaries of research activity
3. Enables the investigation to anticipate potential problems

Research design is a blue print that indicates as to what Activities have to be performed at the different steps of research operation?. How to ensure the appropriate use of resources available to maximum outcome?. Research design minimizes the problems that a researcher has to face at the initial stage of conducting research activity.

Research design dictates the limitations of research activity thus avoids deviation during the tenure of research. It helps the researcher to systematic investigation since the objectives of the research is clear and thus he can have effective control over the findings. It's a guide to a researcher to avoid any

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possible deviation and thus facilitates the collection of data, defining the area of research, specifying the objectives and application of method in Research activity, estimate of cost and time and completion of task in stipulated time.

Research design helps the researcher to predict the problems that may arise on the basis of literature available for study.

Berger et al (1989) suggests following functions of research design

1. It offers a guide that directs the research action, which reduces time and cost
2. It offers a systematic approach to the research operation so that all steps are executed in a right sequence.
3. It encourages coordination and effective organization
4. It helps in the use of resources effectively avoiding bias and errors
5. It enables the researcher to control the research operation more effectively when the research investigators are employed

Manhiem (1977) has suggested following objectives of research design

1. To amass more and more evidence in support of given hypothesis and eliminatealternate hypothesis
2. To make the study in sdo far as possible, replicable i.e; worth repeating
3. To associate variables with one another in such away and gives propositions in such a manner that it becomes possible to determine whether these are related or not with the desired results

4. To determine whether a pilot study needs to be undertaken for future plans of the researcher.
5. To plan such techniques for collecting the data to a minimum economy of time and money.

Characteristics of a Good Research Design

A research work is a subject more of skill than intellect, more of a technique than prudence, more a pragmatic than normative. Prudence can be decorative but may not probably be result oriented or may not suit to the requirement of the data available in hand with the researcher. Research activity therefore should be designed with great care and caution to ensure reliability of the findings and success of a scholar. A good research design is like a diagnosis of the ailing that needs to be cured for the good health of research. A good research design can better cure the possible deviation of a researcher facilitating better control of the researcher in collection of required data and organization of research enterprise keeping them attuned with the subject of study. The Question of a good research design depends mainly on the nature of the problem to be studied, the objectives of study and even more the time and cost involved in study. Research design may not be the same in exploratory research or descriptive research. It may vary according to resource available and the objectives of the research.

Research Design depends on

1. Nature and duration of Data Collection
2. No. of situations involved in research activity
3. Nature of the problem to be studied
4. If Comparative analysis of two situations are involved in research
5. Different Types of research

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In case if Data requires to collected in different time situations. For example- in a study of intensity and magnitude of crimes against woman data may be collected in different time frame such as Data collected in first three months or Data Collected after one year.

1. If the researcher desires to study an individual, a group, a community, an organization the design of research shall be different.
2. If the nature of problem is evaluative i.e; an evaluation of a program is desired different type of research shall be prepared.
3. In Comparative study where data needs to be collected from two different situations an entirely different type of research design shall be applied.
4. Research design solely depends on the types of study- such as descriptive, exploratory and explanatory.

Different Phases in Research Design

Different Scholars have suggested different phases in research design- A few scholars have suggested six phases in Research design.

Specification of the research Problem

The very first phase in research design is the specification of the Problem to be studies. Specifying the problem involves the conceptueal framework of the topic under investigation. The questions such as-

1. What is the problem about?
2. Why it is a problem?
3. What is the socio-political or economic relevance of the proposed study?

Needs to be answered. It is thus all about the conceptual definition of the Problem. The idea may be to determine the aspects of the phenomenon to test the validity of two or more variables

Framing a Research Design

The second phase is the structural framework of the research work. The investigator is expected to determine a framework under which he has to conduct the study. The researcher should be well aware of resources available while framing the design of the research. The designing phase may consist of specifying the concepts and variables in the selected problems, defining the objectives of study, review of other studies, identification of variables of study, operationalization of the concept to measure the variables, Proposing methods to be applied during the tenure of study, designing the steps of analysis and specifying tools of study i.e; Questionnaire, Schedule, Interview, Observation, Case study and the like.

Designing Samples

The third phase in designing of research proposal is sampling phase. The researcher should specify the methods of sampling, size of samples according to needs of the research objectives.

Collection and processing of Data

This is empirical phase. The researcher needs to specify the method of data collection. The relevant data should be sorted and applied in research operation.

1. The other phase of Research design is Data analysis through Editing, coding and Tabulation. This interpretative phase in which generalization are made and conclusions are drawn

2. Report Preparation and publication of Report is the last phase of study.

Different Types of Research Designs

Research designs vary according to the nature and situation of study undertaken. It is therefore pertinent for the scholars to be attuned with different types research designs. Manhiem (1977) has pointed out different types of research in different situations viz. Descriptive, Explanatory, and Exploratory.

Research Design for a Descriptive Research

Descriptive Research is just a description of social situations, social events, social system or social structures e.g; description of 'Increasing political participation of woman in India' 'Intensity and magnitude of Violence against woman'. Descriptive research is based on scientific observation of facts, it should be accurate and precise.

In Descriptive research designs can be one cell, *Ex-post Facto,* multi-cell or panel Design. When the Data are collected in a single situation for a single period of time (S1T1) it is called one cell design. In this type of design is applied in general 'Case Studies methods' where 'Snow ball sampling method' Data collection is used. e.g;- Cases of wife Battering or study of criminals in jail.

Two Cell design is applied when two situation is studied in two different period of time. This is termed Two cell design or *ex-post facto* design'. For example- Comparative Study of voting behaviour in General election 2014 and 2019'. This is also known as longitudinal design. The study may be reverse i.e; study of two situations at a particular time.

If the study of three or more situations is studied in a particular time it may be termed tree or multi-cell design. If the

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study two situations are conducted in two different times it will be four cell design. If the data are collected from one situation in one time and another situation in another time it will be called matched stage design. For example- study of voting behaviour in assemble election of U P in 2016 and voting behaviour of Rajasthan in 2018.

Design for Exploratory Research

Explananatory Research causes of social phenomena. Objective of Explanatory Research is establishing co-relation between variables. How one incident controls or affects another incident. Why do the people agitate against policy decisions of the Govt.? How and why communal rights takes place?

Designs in Exploratory Research

In exploratory research either no information is available or least information is available about the subject to be studied. It exploratory in nature based mainly on primary sources of Data Collection. Mostly exploratory studies are qualitative that explores the intensity and magnitude of a Problem. Exploratory intends to diagnose a complex situation by exploring it's different dimensions. Exploratory research is innovative and and often useful in developing new theories.

Sarantkosh (1998) has suggested reasons for undertaking exploratory research viz.-

Feasibility

Whether the study on the issue proposed is feasible or worthwhile.

Familiarization

The researcher needs to be familiar to with the social context of the issues- relationship, values, standards and factors related to the research topic.

New Ideas (Innovation)

To generate ideas, views and opinions on the issue to understand the problem properly.

Formulation of Hypothesis

Whether variables can be related to each other.

Operationalization

Operationalization of concepts by explaining their structure and identifying their indicators.

Earl baby (1998) has suggested three purposes of undertaking exploratory study-

1. Satisfaction of the researcher's curiosity and desire for better understanding
2. To test the feasibility of undertaking a more extensive study
3. To Develop the methods to be employed in any subsequent study

Zikmund (1988) has suggested three purposes of undertaking Exploratory study-

1. Diagnosing a situation
2. Screening alternatives
3. Discovering new ideas

Different Forms of Exploratory Research

Exploratory Research can be of many forms depending on the nature of study and the purpose fo the research. Zikmund (1988) suggests three categories of exploratory research viz.-

Experience Surveys

A researcher focuses on sharing of experiences with other scholars who have undertaken investigation on similar problems and who can better guide the research activity and research plan to the researcher. This method has been termed **'Expert Survey Research"** by Sheltiz et. Al. (1976)

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Secondary Data Analysis

Secondary data can be used as a feed back for designing a research plan in exploratory research. This is better termed as 'literature review Research' by Sheltiz et al. (1976)

Pilot Studies

It is an informal exploratory investigation which serves as a Guide for larger studies.

A few more typology for research design can be suggested. Black and Champion (1976) and Herry Manhiem (1977) have suggested three more types of research designs-

Survey research design, also termed as field research focuses on "gathering information of a large number of people by interviewing a few of them". This type of design is based on well planned sampling, to ensure reliability of research findings.

Case Study Design needs time and a number of methods of sampling according to the case under observation. Case studies are now popular method of study among the researchers as they are employed in qualitative and quantitative studies as well. Case Study type of design are important to collect more data, formulating hypothesis and to test the feasibility of quantitative studies. Yin (1991) has suggested following steps in Case study Design-

An Overview of the Project

The cases to be investigated, the objectives of study, and characteristics of the case to be studied.

Field Study Procedures

It involves selecting the cases to be studied, Discovering methods of collecting information from the respondents of the unit selected, and pattern of communication,

Structuring Questions

That needs to be addressed in the study,

Determining elements

Determining elements to prepare the reports.

In Case study design a researcher needs to focuses on-

1. Selection of the units to be studied
2. Planning samples according to the need of the issues to be covered
3. Planning methods of Data Collection, data analysis and reporting the generalizations.

Experimental Research Design

In experimental type of design some of the variables being studied are manipulated. One variable (independent) is manipulated and it's effect on other variable (dependent) is measured, while other variables which may confound such a relationship are eliminated or controlled (Zikmund). For example- Denying break between starting work and lunch hour and again between lunch hour and closing hour to the workers is supposed to be hazardous (Ram Ahuja 2009). There is a co-relation of tea break or Lunch break on the magnitude of productivity. Manipulating the independent variable (tea break) affects the dependent variable (Productivity).

In Experimental Research Designs several terminologies are important to understand-

Control Groups

Which is not exposed to experimental variable or exposed to an usual condition

Experimental Group

Which is exposed to experimental variable or some novel or special condition

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Illustration

A Teacher's lecture on Personality Development

1. Group of students not exposed to teacher's lecture (Control Group)
2. Group of students exposed to teacher's lecture (Experimental group)

Extraneous Variable

When the independent variables are not related to purpose of study but have potential to affect the dependent variable. For example- In a study of relationship between children's gain in social studies achievement and their self concept; self concept is an independent variable and children's achievement is dependent variable. Despite the self concept that affects the children's achievement, intelligence also affects the achievement but it is not related to the purpose of study; it may be called extraneoyus variable.

Experimental Treatment

The different conditions under which experimental and control groups are put. (Kotahri 2015) Experimental treatment refers to changing the situations, environment and variables in study. For Example- If 'teacher's lecture on personality development' is avariable; changing the teacher, changing language, changing the time and class environment can be experimental treatment.

Experimental Units

Subjects or entities whose response to the experimental treatment is to be measured. Pre determined plots or the blocks where the different treatments are to be used.

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Randomization of Samples

Selection of samples with an attempt to avoid the possible errors that may affect the result of experimentation.

Some other research designs are Evaluation and action research Designs.

Overall research design in all types of research in discipline of social science more or less comprises following phases-

1. Statement of the Problem
2. Defining objectives of study
3. Defining scope of study
4. Reviewing existing literature concerning the problem
5. Conceptualization or the schemes of study
6. Framing Hypothesis
7. Proposed methodology during tenure of study- Specifying methods of data collection and tools of study
8. Selecting samples applying appropriate method
9. Processing, interpreting Data
10. Operationalization of Concepts
11. Theorizing or generalization

References

Acoff Russel L. (1961)- Design of Social Research, University of Chicago Press, Chicago

Ram Ahuja (2009), Research Methods, Rawat Publications Jaipur

Baby Earl (1998) The Practice of Social Research Wordsworth Publishing co. Albany Newyork

Black James A. and Dean J. Champion (1976) Methods and issues in social research, John viley and sons, New York

Creswell J.W.(2003)- research Design : Sage Publications Thousands Oaks C.A.

Jahoda, Deutsch and Cook (1962).

Kotahri C.R. (2015)-research methodology: methods and techniques (2nd Ed,) wiley eastern Ltd. New Delhi

Manhiem Herry (1977)- Sociological Research: philosophy and methods, the Dorsy Press Illinois

Myres M.D.and Avison D. (2002)-Qualitative research in information System: a reader Sage

Miller, D.C.(1991) Hand book of research designand social measurement, David M.C.Kay co. Newyork

Sarantkosh S. (1998) Social Research (2nd Ed.) Mc milan Press London

Theodorsion G. A. and Theodorsion A. G. (1969), A Modern Dictionary of Sociology, Thomas Y. Crowell co. Newyork.

Yin R. K.(1991)- Case Study Research Design and method, Sage Publications, Newburg Park C.A.

Zikmund William G.(1962)- Business research method (2nd Ed.), The Dryden Press Chicago,

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Review of Related Literature: An Overview

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Abstract

For the start of any journey one has to explore the pathways, which enable him/her to effectively and economically achieve the target. For a research project, review of related literature does the same task. This chapter deals with a brief discussion of not only the meaning and importance of review of literature but it also analyses various sources of information, methods of organization of reviewed literature, instructions of using a library and at last but not least the methods of citing references according to APA citation style of 6TH edition. The purpose of this chapter is to give important guidelines for new researchers and to motivate them to explore more and more information in this direction before initiating any research project.

Introduction

The review of related literature is the most important step in a research work. Basically the fundamental meaning of research is to explore or search those facts which may serve as the best solution to the problem, or one can say that it is a well organised inquiry to remove all doubtful facts and to seek some

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crystal clear answer to the research question. The sources of these research questions are the problems raised by our day to day endeavours which are not being satisfied through previously existing solutions. The answer of such questions may only be explored through researches in that particular field for better use of available resources and to get quick success. Now-a-days it is very common for each and every organisation to conduct researches in needful areas to take risk free decisions. Conduction of authentic, objective and fundamental researches in these needful areas is the science of management and the tactful use of findings of these researches is the real art of management. As for the start of any journey one has to explore the pathways, which enable him/her to effectively and economically achieve the target, similarly for a research project, review of related literature does the same task. This picture depicts that a successful management is based on successful and effective researches in that particular field. Here comes the question that what makes a research work successful and effective? A good systematic review of literature is the answer to this question.

Meaning and Importance of Review of Related Literature

The review of literature is meant for the exploration of origin of the problem.The researcher is expected to be well informed about all possible theoretical and empirical aspects from where the problem is arising and should also know that the problem in question is the needful area for research and exploration, which can only be judged through a proper and meaningful review of related literature. Thus a review of literature is a brief discussion of related conceptual theory, previous research literature, related reports, articles and abstracts published in journals, magazines, chronicles newspapers etc.This

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exhaust study of related literature makes a researcher familiar with the known and unknown facts about the question in hand, making a clear vision about the path way of solution by removing doubts. Only such a comprehensive study of related literature makes the research work original, pure and scientific. It also removes the possibility of duplicity of work which makes it more economic in time and efforts. The researcher becomes capable to precede the work scientifically. Human is a great explorer by nature but if they had not taken benefits of previous researches, then they would have never achieved such tremendous developments in human world. Digging his own well may never help a person to achieve quick success. So, taking the advantage of previous researches is essential for a researcher to make an effective and flawless planning of his research work. It also enables a researcher to identify the limitations of his work. It provides up-to-date, clear and concise knowledge about the work in hand; most effective tools and techniques to conduct the study and it also help in avoiding unnecessary duplicity of research. Thus, one can say that in a research work the review of related literature is an exhaust and critical study process which requires the skill of evaluation of others' work to pave own path.

The review of related literature is not an easy task; as if it not done systematically then it may never serve its purpose. So, for a well organised research work the review of literature should also be very systematic. Sometimes one reference may lead to several other references, so a clear categorization of references should be followed for this purpose. The researcher should have the idea of note taking, book reviewing, using microfiche, writing proper references, development of bibliography etc. The study material should also be categorised according to its nature such

as literature related to concept, research thesis, dissertations, annual reports, newspaper or pamphlet etc., otherwise the review will likely to lose its specific purpose and will only appear as a heap of unusable knowledge. Thus, to make a thorough survey a researcher has to understand its importance and should take it as most important key part for an effective research work.

Sources of Information

When a researcher decides to conduct a research in any needful area, the very first thing he has to understand is the significance and justification of that work. Here comes the need of not only a keen observation of the problem but also to have some review of related literature to clarify the concepts and to analyse the previous researches in that particular directions. This becomes helpful in further planning of whole research. The task of review is not so simple, as if it is done in an unsystematic manner without proper noting and referencing then its relocation or citation will become very difficult and after sometime the researcher will not be able to use it for decision making. Thus, a proper categorization of related literature is an essential step for proceeding further. The whole literature can be categorised basically in three type i.e. primary, secondary and general sources of information. In the study of any organization, institution or other management fields the example of primary sources of information may also be called as direct sources such as annual reports, news pamphlet, author's reports of his own work which may be in the form of thesis, dissertation or published books, autobiography, article, and other publications. The review of these sources is very useful not only to justify the significance of work but also provide effective information about tools, techniques, research methodology, statistics etc. to be used for the proposed work. Though the review

of primary source of information is bit lengthy and tire task still it is unavoidable for a good planning of a research project.

Other category of sources of information is secondary, which comes in the form of encyclopaedia, almanac, indexes, directories, surveys and annual research reviews etc. In fact, these sources are giving information indirectly. It means that these sources are not directly explored by the researcher i.e. the primary research work of a researcher is being analysed by others and presented in the form of these sources of information. They interpret the findings in their own way which may vary to the original one. These sources are also very useful for researchers as they provide more information in less time and efforts; the only drawback is the impact of subjectivity on inferences which may hinder the researcher in taking right decisions. The third type of study material may be categorized as general category e.g. newspapers, magazines, bibliographical list etc. which mainly helps a researcher in initial steps of locating the problem and the needful area for research. In fact, sometimes bibliography list is not included in review of related literature as mentioned by Crossman, (2017) that "a bibliography is a list of resources consulted when researching a particular topic. Literature review is not only a list of sources but is much more which are critically evaluated by a researcher. Review writing is a rigorous process requiring a thorough evaluation of the quality and findings of each source discussed."[1] Thus for best judgement a researcher should go through a thorough review of all types of sources of information related to the topic.

Organisation of Reviewed Literature

When a researcher locates the study material then the first thing, he/she has to follow is the organization of literature, for

which researcher has to classify the material according to its nature and place of publication such as sources from abroad or local source. The researcher can also classify primary sources of information into types of sources such as annual reports, thesis, dissertation autobiography, articles, books, etc. A comprehensive note making procedure should be followed for each type of source and simultaneously a bibliographic card should be developed for that reference. To make notes more precise one can follow a grid formation, in which all the essential information of that particular reference is mentioned in a table. If such grid is developed by the researcher about every key- term, then it will be helpful for him to relocating the material. Crossman,(2017) in his online published article titled as "How to get started on a literature review" has mentioned the steps to be followed for the organization of notes as follows-(i) first start search with some key words,(ii) then organise literature in a grid or table form mentioning author, publication type, place, year, title/ keywords, sample methodology, tools and statistical techniques applied, major findings and relevance to my research question."[2] Thus a grid formation makes the literature pin pointing, crystal clear and easy to relocate in future. Such collection of related literature makes it a well organised and systematic review helpful for paving the path for project in hand. Regarding the formation of references and bibliographic list another important task for a researcher is to develop proper reference of each note. For this a researcher should develop references cards for each and every noted review mentioning its number. The author of the book titled 'Methodology of Educational Research' Kaul, (2009) has illustrated the method of developing such bibliographic cards. According to him for the development of bibliographic card a small card made up of card

sheet should be used for mentioning reference number and all essential information such as author's name with last name first, title of his work, publication, name of publisher, date of publication, volume number and page number. For library books the library call number of that book should also be mentioned on the card to easily recollect it in future. If some information is missing leave some blank space for that to include it when acquired."[3]

Taking a research note is somehow a technical task. It is also very essential for a researcher not only to have good command over the language but he/she should also be familiar to various ways in which he/she can collect the notes.Best and Kahn (1996) in their book titled 'Research in Education' have mentioned following four categories of reference notes:"(i) Quotation-These are exact words of an author reproduced enclosed in quotation marks. (ii)Paraphrase-the reader restates the author's thoughts in his/her own words.(iii) Summary- The reader states in condensed form the contents of the article.(iv) Evaluation- The reader records his/her own reaction, indicating agreements or disagreements interpreting the point of view of the writer."[4] Here they also suggested following a proper note making method i.e. making note cards. Skimming of the references is essential before starting a note. This whole description depicts a clear picture of organization of reviewed literature, which includes categorization of selected material followed by development of summarised, précised notes related to key points including all relevant information together with the development of bibliographic cards for each and every reference to facilitate the researcher for its easy retrieval and citation.

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Guidelines for the Use of Library

A researcher's work may not reflect perfection if he/she is not well trained in using library perfectly. A library is not only a collection of books but is full of such techniques which facilitate a reader. According to Best and Kahn (1996) 'besides the old system of card cataloguing, now-a-days libraries are fully computerised through which study material may be located easily. Libraries are also possessing online computer library centre (OCLC) connecting various libraries together to facilitate the reader a quick access of all references under same roof through a time-sharing computer system available in computerised libraries.'[5] Photocopying facility is also available in the library. Development of Microfiche is also one of the significant contributions in this field which helps in providing economic and convenient storage of study material which may be magnified on screen, a reader can also get a printout of any required page.

To avail benefits of such time saving facilities a researcher must know the general guidelines of using it. Kaul L. (2009) the author of book titled 'Methodology of Educational Research' has mentioned these guidelines suggested by Van Dalen (1973), the important points are as under: [6]

1. First familiarize yourself with the layout, facilities, services and regulations of the library.
2. Learn how to use microform readers, photocopies and other mechanical aids. (now a days computer knowledge is essential for this purpose)
3. In library there are stacks, periodicals, reference section, reserved books, and rare books room, so a reader must note the place where required material is placed frequently.

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4. In a library every book has a call number so a researcher should make a list of these call numbers needed in one library session.
5. Copy all information carefully that the librarian needs to obtain that reference.
6. Before initiating search for material in library, write down questions that cover precisely the information required by the researcher and group the questions in accordance with the areas in library where the answer may find.
7. Keep the list of best reference books, indexes, handbooks, historical studies and legal references in required area of specialization.
8. Obtain copies of best bibliographies and reprints of significant research studies for filing.
9. Note which periodicals regularly or occasionally prints bibliographies, reviews or literature, or such other reference material and the issues in which they appear.

Citation of References

Citing the references in a research work is very essential for the authenticity of that work. It also indicates that the research is based on facts and is justified properly. If any research presentation does not have proper citation, then that work fails to complete the essentialities of a perfect research. The American Psychological Association (APA) style (6th edition) is the most approved way of citation of references. The method of citing reference in-text and in references have many variations, so to present the review of related literature perfectly a researcher should have a complete idea of this citation style. Though it is very time taking and difficult task but once a researcher makes a habit of using this style of citation, then it becomes his/her routine

practice. No researcher can overlook it if he/she wants to make the presentation effective and authentic. For such practice a researcher should first be familiar to the methodology of this style through APA or some other appropriate websites and then try to practice it while using library. Some online apps are also available which can be used to format a reference list in APA style. Here are some examples of common citations of references according to APA citation guidelines website[7&8]:

Citation for article in offline and online periodical, journal, newspaper–

1. APA style dictates that for article in periodical/journal/newspaper the author's last name, then initial name followed by publication date should come first.
2. Followed by the title of article which should be written in sentence case, (only first letter and proper noun in the title are capitalized).
3. Followed by periodical/Journal/newspaper/survey name written in title case (means all words except articles and prepositions are capitalized).
4. Followed by volume number, (issue number), and page number.
5. The name of periodical together with its volume number should be italicized, and issue number should be written in parenthesis but not italicized or underlined.
6. For online citation mention retrieved from URL or DOI (Digital Object Identifier) while other things remain the same.

Example (offline)

Paul, S. (2001) A study of fundamental research, *The Horizon, 77*(5)6-10.

Example (online)

Crossman, A (2017): How to get started on a literature review, retrieved from https://www.thoughtco.com/get-started-on - sociology-literature-review--302663

Citation for Books

1. In APA style citation for books, the author's name, year of publication, Title of book should be written in sentence case and italicized
2. after this comes place of publisher (List the city followed by country),
3. Followed by a colon and then the name of book publisher.
4. If the book is edited without an author, then the name of editor or editors should be mentioned with (Ed.) or (Eds.) respectively.
5. When there are two or more names then ampersand (&) should be used in place of and.
6. On the other hand, if the book is edited with one or two authors then list the author/s last name first followed by their initials and year,
7. Followed by the title of book in sentence case and italicized.
8. Then list the editor with their initial before their last names and also indicate their role as (Ed)Written in parenthesis.
9. Then location of publisher followed by colon and then name of publisher.
10. For more than seven authors list the last name of first author followed by initials and then use et.al.

Example (Book)

Kaul, L. (2009), *Methodology of educational researches,* Noida, India: Vikas publishing house PVT.LTD.

Example (With Editor)

Editor, X. (Ed.), (2015), *Title of book,* New Delhi, NDindia: Dhanpat Publication PVT.LTD.

Example (With Editor and Author Both)

Author. X. (2000) *The title of book,* X. Editor last name (Ed.), New Delhi, ND: Rai publications.

Example (With More Than Seven Authors)

Example- Glaser, R et al. (1996). *Organization for research and development in education*, Bloomington, India: Phi Delta Kappa.

In text Citation

1. Generally in text citation is written inside a parenthesis with the last name of the author and year of publication separated by comma or if the name of author is listed with in text only the year is written inside the parenthesis.

   Example-(Best, 1999) or Best (1999) found…..
2. Further if a part of a work is directly quoted then include the name of the author, year and page number or the paragraph number.

   Example-(Best, 2008, para 6) or According to Best (2001, para 6).
3. For work with no date use n.d.

   Example- (Kaul, n.d.) or Kaul (n.d.).
4. For in text citation use only last name of author but in references also use initials after author's last name.
5. For online citation mention retrieved from URL or DOI (Digital Object Identifier) while other things remains the same.
6. For using same reference twice, a Latin abbreviation 'ibid' is generally been used in Chicago style of citation. Which means "the source I cited" but is not generally used in APA style. It

prefers to repeat the reference twice or using its short form with page number.

Thus, there are so many things to be cited in a research paper just as a periodical, journal, magazine, dissertation, research thesis, online publication, photograph etc. There is a provision for each type of citation in APA (6th edition) style of citation which needs to be discussed in a complete chapter. Here, some of the very common examples are being discussed due to the need of this chapter. Furthermore, the researcher should be well equipped with the most common types of citations for his routine library work and should be able to consult online guidelines regularly.

References

1. *Crossman,A. (2017) How toget started on a literature review, retrieved from https://www.thoughtco.com/get-started-on-sociology-literature-review--3026063*
2. *Crossman, A. (2017): How to get started on a literature review, retrieved from same link.*
3. *Koul, L.(2009): Methodology of educational research,Noida, India:Vikas publishing house PVT.LTD.,p181.*
4. *Best, J.W. & Kahn J.V. (1996): Research in education, NewDelhi, N.D. India: Prentice hall of India PVT.LTD., p-49.*
5. *Best J.W. & Kahn J.V. (1996): Research in education, p-51.*
6. *Koul, L. (2009): Methodology of educational research, pp 169-170.*
7. *APA citation guidelines: 6th edition, retrieved from www.bibme.org/citation_guide/apa/*
8. *https://apaformat.org/apa-website-citation/*

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Other References

Kerlinger,F.N.(1995):Foundations of behavioural research, 3rd edition, Basavanagudi, Bangalore, India: Prism books PVT.LTD.

Tatke, J.(2009): Reaearch Methodology, SCDLpune,India: Symbiosis centre for distance learning.

Shmotkin,et al.(1999): Review of related literature, retrieved from Shodhgangotri.inflibnet.ac.in/bitstream/123456789….

Shodhganga(n.d.):Review of related literature.Retrieved from Shodhganga.inflibnet.ac.in/bitstream/10603/1551/11/11…..

https://www.igi-global.com/publish/contributor-resources/apa-citation-guidelines/

https://www.mendeley.com/guides/apa-citation-guide

Writing Qualitative Research Paper
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Research Design in Quantitative Research

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Research design is defined as a framework of methods and techniques chosen by a researcher tocombine various components of research in a reasonably logical manner so that the research problem is efficiently handled. It provides insights about "how" to conduct research using a particularmethodology.

According to Claire Seltiz and others (1962), "A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure."

In fact, it constitutes the blueprint for collection, measurement and analysis of data. The research design comprises of what the researcher wants to work upon; the topic, main points on which the research is supposed to be done, how the data and information has to be assessed as per the requirement of the objective. The main feature lies in here that what methodology is to be applied to come out with a perfect finding and lastly how the report has to be written so

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that the data and information can be churned to provide a final output. Research design is a complete package of sampling design, observational design, statistical design and operational design. Afterwards begins the task of gathering information relevant to research and then forming up the strategy to analyze the data and time and cost etc.

Research design facilitates the smooth ongoingofdata, techniques of analysis according to the objectives of research and availability of staff, time and money. A good research design is characterized by flexibility, appropriate, efficient, and economical and so on. Reliability of results depend upon the entire foundation constituted during research design.

Research design entirely depends upon the type of research problem. Appropriateness of research design involves following factors:

1. The means of obtaining information;
2. The availability and skills of researcher and itsstaff;
3. The objective of the problem to bestudied;
4. The availability of time and money for the researchwork.

Quantitative and qualitative research methods are two general approaches to gathering and reporting data. Both these methods have their advantages and disadvantages, and each of these research approaches is suitable for answering particular types of questions.

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Basisfor Comparison	Qualitative Research	Quantitative Research
Meaning	Qualitative research contains data in which the classification of objects is based on attributes and properties.	Quantitative research contains data which can be measured and expressed numerically.
Research Methodology	Exploratory	Conclusive
Approach	Subjective	Objective
Analysis	Non-Statistical	Statistical
Collection of data	Unstructured	Structured
Determines	Depth of understanding	Level of occurrence
Asks	Why?	How many or How much?
Sample	Small number of non-representative samples	Large number of representative samples
Outcome	Develops initial understanding.	Recommends final course of action.

Quantitative research methods are based upon objective measurements and the Statistical, mathematical or numerical analysis of data. These data collection work can be done through polls, questionnaires and surveys etc. Also, at times the data is being analyzed by manipulating the data which is already existing through computational techniques.

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When we talk about computational techniques; it focusses upon descriptive statistics like the mean, median, and standard deviation, but it can also include inferential statistics like t-tests, ANOVAs, or multiple regression correlations (MRC). The important and major facts are derived through statistical analysis done upon research data including preference trends, differences between groups, and demographics.

These quantitative techniques usually make use oflargersamplesizesbecauseitsmeasurablenaturemakesthatpossibleandeasier.Itallows us to answer various questions like "how many?" and "how often?"

The entailing of the collection of numerical data and bringing forward the relationship between theory and research as deductive, a predilection for natural science approach along with possessing an objectivist conception of social reality comes under the head of quantitative research.

Generally, the random sampling and structured data collection instruments are used as the main methods for Quantitative data collection. Also, closed-ended questionnaires, experiments, correlation and regression analysis methods are few more popular quantitative data collection methods. The result and outcome that we avail from quantitative studies are mostly observed to be easy in presentation, summarizing, comparisons and generalizations.

Data collection methods in quantitative research method are highly structured and follow rigid techniques. Hardcore quantitative data collection strategies work upon Experiments/ clinical traits, questionnaires, observing and recording well-defined events, online surveys, paper surveys, and interviewsetc.

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Quantitative Research: Sources of data

Various questions can be answered through the collection of basic data. In case, a question is asked in context to govt. policy or industrial problem, the kind of data can affect the fortunes of Govt. and/ or industry. Therefore, importance lies herein in the source of data that provides the information. Data can be divided into:

a) Documentary source and
b) Field source: this is more apt for researchers

Primary Sources

First hand source or original source acquired by the researcher is known as the primary source of data, which has not been collected earlier. This is a kind of data that is collected through principle sources of observation and surveys. Such data facilitate fresh and original investigations and observations, leading to worth, important, useful and valuable outcomes. The outcome or result, which is based upon the primary data are supposed to be empirical and possess a great utility feature in them.

The data being collected and compiled through primary sources without any partial approach is generally more reliable, dependable, accurate, specific and more apt for the specific piece of investigation. The moment, data which is collected through primary sources is being put under scrutiny, analysis and to be worked upon, it loses its original characteristic, and gets converted to secondary data.

Henceforth, the data which was primary in nature at some point of time, becomes secondary at the later stage.

Secondary Sources

The information or the data, which is being collected by people other than researchers for the purposes other than a

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purpose involved in relation to a research project, is known as secondary data. For example: The annual accounts of a company for purpose of presenting the company's financial status and performance. But for a researcher, it may form a secondary data as it is used, perhaps in part, for some other purpose and is independent of research investigation. The sources of secondary data consist of reports such as annual reports and accounts or company reports of various government departments, Reserve Bank of India's various annual reports. National sample survey reports, UNO, UNICEF, WHO, ILO or world bans' various reports compiled. In fact, books, journals, manuscripts, diaries, letters etc., also form the secondary source of data. The main characteristic of secondary source of data is that that it is always readily available. Above all, the researcher does not have any sort of control over collection of secondary data. Its form and content are not at all being pruned by a particular researcher.

It is dependent upon second-hand information only. If secondary data is to be collected and worked upon, it is already being collected, compiled and presented already by agencies for the purpose of investigation. Population census reports, national sample survey reports, economic and statistical reports, data banks of any professional association or trade organization are examples of secondary data.

A researcher is always free to use part of such data, results or findings in his own research study, if need be and it proves to be useful. More elaborately, the difference between primary and secondary source of data is technical and a matter of relativity. Data that is primary in the hands of one becomes secondary in the hands of the other. A researcher should be able to construe what is appropriate and most suitable for his

research. The judicious use of both really contributes enrichment of the utility for study.

Data Sources

Primary Sources

Interview

This forms one of the important methods of data collection. It involves systematic conversation between an interviewer/ investigator and the respondent for getting relevant information for a specified research problem. It is said that the respondent's facial expressions, bodily gestures etc. also help to learn important things governing his answers to the problem under study.

Observational methods are less effective in giving information about a person's perception, attitudes, beliefs, feelings, motivations etc. To obtain such information, the interview method is very effective. Interview though can be a main method of collecting data, can also become a supplementary one to observation method. It is also capable of collecting a wide range of data from demographic to social characteristics, to future intentions of a person. It also seems to be superior as people prefer to talk than write. In fact, the more confidential of the information can be obtained by this method. It helps probing into the problem deeply and to get correct answers to the same, and to get clarification for many replies containing relevant information.

Objectives of Interviews

The objectives of interviews are two fold:

1. to exchange ideas and experience and
2. to elicit (collect) information

The main purpose of interview as a tool of data collection, in a broad manner is to gather data either of the ways; extensively

and intensively. The objectives of interview are usually an exchange of ideas and experiences churning out information pertaining to a very wide range of data. Herein, the interviewee may wish to rehearse his past, define his present and canvas his future possibilities.

Questionnaire

Paper-Pencil-Questionnaires

Such questionnaires can be obtained from a large number of people at the same time. It saves the researcher's resources, specifically; time and money. People don't hesitate while responding to the questionnaires as they are free from the fear of getting into any controversial issue. While filling up the questionnaire the identity is not to be specified. The responses are made in the name of anonymous. But the biggest disadvantage lies in here is that quiet often many people who receive questionnaires don't return.

Classification of the Questionnaires

1. Structured questionnaire
2. Non-structured questionnaire
3. Codified questionnaire and
4. Un-Codified Questionnaire

Structured Questionnaire

A Structured questionnaire contains definite, concrete and pre-ordinated questions, with additional questions limited to those necessary to classify inadequate answers or to elicit a more detailed response. For the purpose of better understanding, a structured questionnaire may be defined as the type of questionnaire which is segmented and designed to elicit detailed and accurate information under the given titles and sub-titles. It helps to obtain accurate and apt information according to the needs and scope of the research. It enables

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the researcher to save much time and energy in processing the data. For example, if the study is related to consumer behavior, the questionnaire may be structured under various titles, viz.

1. Personal data
2. Consumption pattern
3. Consumer products market
4. Industrial product market and
5. General information

Non-structured Questionnaire

Non-structured Questionnaire is simple questionnaire without any segmentation of sub-division. It carries few simple questions, one after the other in a systematic manner. This format is useful for simple form of studies. For example, in a simple study of trade union membership, the questionnaire may contain a few questions, viz, the name, age, educational background, section or department, name of the trade union, years of membership, remarks, if any, etc.

This questionnaire is easier for processing, especially with the help of a computer. It is convenient for the informant also, since he has to spend only very little effort and time on it, while it is easily understandable.

Uncodified Questionnaires

Uncodified Questionnaires are very simple one without codification, As in the non-structured questionnaire, questions are asked without any codification.

Codified Questionnaires

Codified Questionnaires actually comes in existence at the time of compilation, if needed or necessary.

Observations

“Observation is a systematic and deliberate study through the eye of spontaneous occurrences at the time they

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occur. The purpose of observation is to perceive the nature and extent of significance interrelated elements within complex social phenomena, culture patterns or human conduct." Data may be collected through systematic observation by, say, counting the number of users present and currently accessing services in a specific area, or the number of services being used in a designated vicinity.When quantitative data is being sought, the approach is naturalistic observation, which mostly involves using the senses and keen observation skills to get data about the "what", and not reallyabout the "why" and "how". It is a quite simple way of collecting data, and not as expensive as the other methods. Disadvantage is observational skill and biased attitude of researcher.

Features of Observation

Eye Observation

A trained observer never trusts the heresay. He believes and puts his trust only in that which he has seen with his own eyes. The report has to be first-hand evidence of his eyes. It is said, "Half believe what you see an do not believe at all what you hear".

Aim

The aim is a verification of hypothesis, discovery of certain facts of the knowledge of casual relations inherent in a phenomenon.

Planning

It needs certain equipment and instruments to plan for an observation. Also, various kind of apparatuses are required at times for this planning assignment depending upon the need.

Recording

It is not necessary that whatever we read, learn or

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understand, we can retain it. Henceforth, the most important thing here is to record the data and information. The methods for recording can be through writing, audio recording or video recording etc.

Secondary Sources

Internal Sources

Private Documents or Personal Documents

1. Bibliography
2. Camera
3. Directions
4. Encyclopedia
5. Films
6. Indexes
7. Journals
8. Magazines
9. Newspapers
10. Public speeches
11. Radio
12. T.V.
13. Tape recorder
14. Use of Mechanical Devices
15. Year Books

External Sources

Unpublished record – Not available to people in published form.

References

Koul, lokesh (2013); Methodology of Educational Research (fourth edition), New Delhi, Vikas publishing house pvt.ltd.

Kothari, C.R. (2007); Research Methodology: Methods and Techniques, New Delhi, new age international

(p)limited.

http://www.stat.ncsu.edu/info/srms/survpamphlet.html

http://www.questionpro.com/pricing

http://www.libguides.usc.edu/writingguide

http://www.staticssolutions.com/dissertation-consultingservices/quantative-dissertation- consulting

http://len.m.wikipedia.org/w./extentions relatedarticles

http://www.uxmatters.com/webfrontsproducts

Writing Qualitative Research Paper
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How To Write A Good Research Paper

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A good research paper gives the readers a new insight into the subject matter and allow them to think about the issues involved in more intense and holistic manner.

How to write a good research paper? It is a very long, rational process and great learning experience. The writing process can be divided into three components -

Pre Writing Stage

To think about research problem and it can come from a variety of sources like books, journals, articles, seminars etc. These sources generate some ideas which remain inside us and need them to bring outside. Use molar to molecular analysis to make a fruitful topic. A topic may be considered interesting if it has the potential to attract the attention of others.

We must consider topic from different angles as— describe, compare, associate, analyze, apply, argue for and against.

After selection of a topic, different ideas are generated but they are not in sequence and in proper manner. All these

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ideas need to be passed through the rigours of academic defense and a good library is very helpful for survey of related literature to fulfil our fundamental requirements.

There are basically two types of sources that can be use for quantitative research – Primary Sources and Secondary Sources. In quantitative research primary sources are the original documents in form of Gazettes, Diaries, letters etc. and secondary sources are in the form of articles, books, internet and other sources.

We can apply survey method, fieldwork etc. to collect data and when we report the data in the narrative form it is called qualitative research paper and when we report it in the numeric form it becomes quantitative research paper. Both of these are called empirical papers. We can also write in blended method called qualiquantology.

Writing Stage

Before writing the paper we should arrange ideas, thoughts and concepts in proper manner and make bibliography of all the sources we consult. The writing stage comes after a long process. The research paper has to be structured around the specific problem, general and specific objectives, methodology of research, research hypothesis and null hypothesis. All of them should be write into the introductory part of the paper and after it all paper should write in essay form with tables and other necessary data.

Research paper should be in analytical form. It must be critical, comparative and evaluative in all manners.

Post Writing Stage

It is polishing stage and we must revise the paper and check for the length, grammatical errors and linguistic simplicity and writing format it should be according to the requirement of the Journal.

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We can take suggestions from subject specialist, our friends and others .At the end of research paper we should give references and other necessary information .

There are several referencing styles and according to demand of journal and subject we can follow any of them. Most common styles are –

APA (American Psychological Association) Used in Education, Psychology and Science.

MLA (Modern Language Association) is used in Humanistic Subjects.

Chicago Style is used in History, Business and Fine Arts.

References

1. *How to research (2006) Lorraine Blaxter, Christina Hughes, Malcolm Tight, Edition:3, Published by Mc Graw Hill International,*
2. *Pandey K.P. (1991) Shaikshik Anusandhan Ki Ruprekha, Amitash Prakashan, New Delhi, Page No.-240*
3. *http://owl.english.purdue.edu/workships/hypertext/research/w/index/html*
4. *Verma, A.K.(2009) writing research Paper, Article Published in proceedings of workshop, Christ Church College, Kanpur.*

Writing Qualitative Research Paper
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Systematic Way of Drafting an Effective Research Paper

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Abstract

This research paper aims to make a vivid yet lucid study on how to write an effective research paper. Writing a research paper is an important skill required for an academician and it plays a vital role in the field of academics. This study discusses on how a research paper should be sectioned in a systematic way for it to be conceptualized to be understandable by the reader. It begins with the things ought to be done at the initial stage or the pre-writing stage, and then gradually moves to the writing stage where the actual work is done. Focus is given on the Types, structure, scope and limitations of a research paper in specific. This paper intends to provide a few tips on writing research papers for researchers who are in the beginning stage of their career.

Key Words: Research paper, systematic, scope, limitations

Introduction

Research paper is an integral part of the research process and a career in academics. In the initial stage writing a

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research paper in a standard scientific style may be a difficult task for a novice, but even at that point of time it is vital to see if one's message is put across in an effective way. A research paper is a technical or a scientific piece of writing which involves the process of critical thinking, researching, compiling, organizing and evaluating.

Types of Research papers

A research paper can be approached in different ways and this entirely depends on the topic of research chosen by the researcher. The format once decided should be the tone of the entire paper and a best way to present the information to the readers in a comprehensible manner.

Analytical Research paper

An analytical research paper is where one has to collect data and information from other researchers and analyse it and present his interpretation in a neutral way. Here the researcher is not free enough to show his positive view or negative view on the topic discussed.

Persuasive or Argumentative Research Paper

In this type of research paper the pros and cons of an issue is discussed in detail where preference is given to one side and the author tries to persuade or convince the reader to one side of the issue which the author himself supports. This suits best to present a current topic that is highly debated.

Compare and Contrast Research papers

This type of paper deals with two different subjects and deals with their similarities and differences in a detailed way. The objective of this paper is to enlighten the reader with the rationality of the two topics. This format is often preferred in literature to discuss about various genres and writers of different eras.

Cause and Effect Research Paper

This type of writing is where a situation is described and its causes and effects are explained and eventually a conclusion is drawn based on valid data and evidence. This proves to be informative and interesting for the reader if it has appropriate supporting documents.

Experimental Research paper

This is where an experiment is done and its procedure and course of action is discussed in detail and the final result is presented to the readers with proven facts. The intention of the study is to present some causation or predict a phenomenon of certain substance or actions and is usually adopted in science and technical subjects.

Survey Research paper

This type of research is usually done in subjects like Sociology, History, Economics, Marketing, Advertising etc. Here a survey is conducted and a critical analysis is done on the information gathered before drawing a conclusion. To simplify the process a list of questionnaire is prepared before approaching the respondents. This in turn enables the process to be carried out in the right track.

Problem- solution research paper

In this case a widely recognized problem is described and a conducive solution is provided and the writer aims to defend his solution in a reasonable way.

Pre-Writing Phase

This is a term used to denote the preliminary work that is done before the actual writing. It involves a series of actions like thinking about a topic and narrowing down its scope and

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limitations, collecting materials or data regarding the topic, organizing the information and preparing an outline sketch of the proposed research paper. A vast reading is the essential requirement of any research work. Reading of background material, analyzing and investigating the data collected plays a vital role in this stage. This phase is very important as it steers the mind of the author in a particular direction which will definitely help him in presenting his objective in a convincing manner. It helps the author to comprehend the topic himself.

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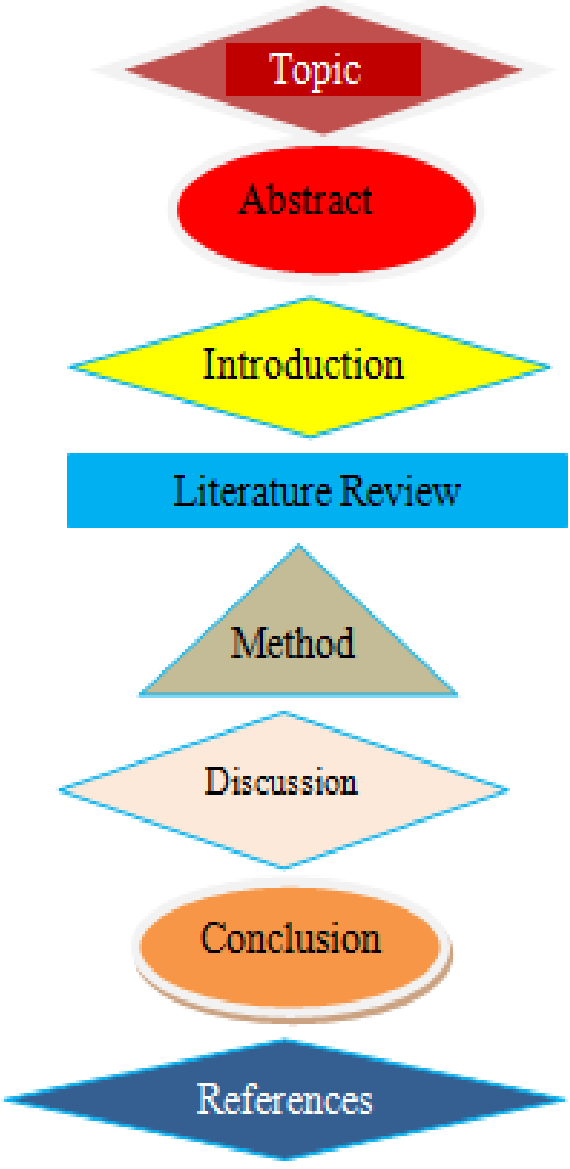
Structure of a Research Paper



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Title

Title plays a very vital role in a research paper and it should be framed in a lucid and attractive way. It should exactly reflect the issue discussed by the author. The title should be specific enough to give a clear idea of what the investigation is about. Focus should be on the theme of the paper and should avoid ambiguous words. A well framed title will not only be unique but will be beneficial and informative for the reader.

Abstract

An abstract is a one paragraph summary of the entire paper. It is generally written after the completion of the entire paper. This should contain all the essential contents that is relevant and vital enough for a potential reader. An informative abstract should extort all the vital information including the problem discussed, method adopted to solve it, results obtained and the conclusions derived. An effective abstract is a concise statement of objective and scope of research.

Introduction

In this part a brief note on the problem to be investigated is discussed. Here we say why the topic was chosen or any background information or any specific reason that inspired us to choose the particular topic. There should be a clear focus and the details of scope and delimitations should be mentioned. It must also state the need to discuss that particular issue. It should also enunciate the major issues to be addressed in the research paper.

Literature Review

Review of literature is very important and explains the reader as what work has been carried out by the researchers on the topic which is being discussed. It should enumerate all the major studies done on the particular topic and all the works that

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has been cited or quoted. This may be from a journal a newspaper or a personal interview conducted. At times literature review is included in the introduction section, but a separate section is preferred where an elaborate review of literature could be presented. This is the portion where credit is given to those who laid foundation for your research. It also shows the ability of the writer to critically analyse and integrate the existing literary work.

Methods

The method section is very important as it describes the procedures undertaken to collect the information and methods adopted to tackle the research problem. This section should contain valid and sufficient information for another qualified researcher to carry forward his/her study in the topic concerned. It would be better to suggest other feasible methods and convince the reader that your method would be the most appropriate one to address the issue. The method section should be elaborate and must provide sufficient detail of experimental methods, materials and theories collected. Any specific instruments used or strategies applied should be described.

Analysis and Discussion

This section is generally the longest section of a research paper where the discussion or analysis done regarding the issue is presented. Here the procedure adopted and hence the conclusion arrived must be based on evidence. This can be better achieved by presenting the discussion in a logical sequence. Novelty and importance of the research work undertaken is justified by clear reasoning and solid argumentation with appropriate data. An effective research paper has a clear focus and avoids meaningless discussions. This section should be

concise and effective and in short, justify how your research contributes to the current knowledge in that particular field.

Conclusion

The conclusion section of a research paper has its own importance and must be drafted briefly and concisely in such a way to make the reader completely informed. This part should summarise the introduction along with the discussion and the result obtained. An effective conclusion is one which gives the entire idea of the research paper when read independently. It could also raise questions for further research that could be initiated based on the results arrived.

Reference

The reference section includes all prior works which are referred in the entire research paper. It is very important to acknowledge all the previously published works that are relevant to strengthen the research paper and to avoid your work being labeled as plagiarized. This citation of references is different and varies from one field to another. For instance Technical study follows a different style while it differs for law and humanities. Sufficient references should be cited and it should accessible by the readers. Various citation methods include American Psychological Association (APA), Chicago style, Council of Biology Editors (CBE), Modern Language Association style (MLA), Association for Computing Machinery (ACM) and is mainly adopted based on the discipline of the research work.

Significance of Scope

While a research work is undertaken it is very crucial to define clearly the scope of the study and its significance. Basically scope of the study is nothing but the breath, width and depth of the topic discussed in a logical way. The scope of the study

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should be defined in the preliminary stage of the work in order to give a clear cut idea to the reader. Clearly presenting the scope in the initial stage indicates the researcher's understanding and motive of the work. A clear and comprehensive scope is one which explicitly defines the limitations of the study and specifications of theories and data used for research. Time and budget are few constraints which limits the scope of a research. The scope of a study mainly depends on the topic chosen. Hence the topic we choose should be neither too narrow nor too wide. When a topic is too narrow difficulty arises in getting data, on the other hand if it is extremely broad, there arises a problem in limiting its scope and will end up in a futile task to cover a broad topic.

Conclusion

The basic objective of this paper was to give a general idea of how an effective research paper could be drafted. It also discussed on the structure and writing techniques that could be adopted. The structural parts of a scientific research is discussed in detail to help a beginner of any discipline of research. This would definitely create a lasting impact and prove to be an introductory guide for an early stage researcher.

References

1. *Berry, R, How to Write a Research Paper, Pergamon Press, Oxford . 1986.*
2. *Day, R.A How to Write and Publish a Scientific Paper, ISI Press, Philadelphia, PA, 1983.*
3. *Gibaldi, J. MLA Handbook for Writers of Research Papers, The Modern Language, Association of America, New York , 1995.*

4. *Hammermeister, S. How to write an abstract/prospectus, Writing Center, University of Nevada, LA. Available online at: http://writingcenter.unlv.edu/writing/abstract.html 2002.*
5. *O'Connor, M. Writing Successfully in Science, Chapman & Hall, London 1995*
6. *Paul T. P. Wong, Ph.D., C.Psych, How to Write a Research Proposal, www.meaning.com, May 8, 2002.*
7. *Swales, J.M. Genre Analysis: English in Academic and Research Settings, Cambridge University Press, Cambridge 1993.*
8. *The University of Chicago) The Chicago Manual of Style. Available online at: http://www.chicagomanualofstyle.org/, 2010.*
9. *Yuksel, A 'Writing publishable papers', Tourism Management, Vol. 24, No. 4, 2003.*

Writing Qualitative Research Paper
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How to Write a Good Title, and Introduction

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Abstract

An introduction is the first paragraph of a written research paper, or the first thing you say in an oral presentation, or the first thing people see, hear, or experience about your project. ... The introduction gives the reader the beginning of the piece of thread so they can follow it.

The introduction to a research paper can be the most challenging part of the paper to write. The length of the introduction will vary depending on the type of research paper you are writing. An introduction should announce your topic, provide context and a rationale for your work, before stating your research questions and hypothesis. Well-written introductions set the tone for the paper, catch the reader's interest, and communicate the hypothesis or thesis statement.

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The introduction to a research paper can be the most challenging part of the paper to write. The length of the introduction will vary depending on the type of research paper you are writing. An introduction should announce your topic, provide context and a rationale for your work, before stating your research questions and hypothesis. Well-written introductions set the tone for the paper, catch the reader's interest, and communicate the hypothesis or thesis statement.

Writing Your Title

The title should describe what you are studying and to what effect. For example, my thesis was called: The Hero Soldier: Portrayals of Soldiers in War Films This title hits all the main points: What: soldiers as heroes Where: war films Concept: the way they are portrayed. This covers the basics and only the basics, don't include your research methods, your results, or your pet's name (seriously). Hit the main points that people will:

1. Be searching for (Google, Library Databases, etc.)
2. Catch their attention
3. Tell the audience exactly what the study is about

That's all. I didn't call my thesis: A Qualitative In-depth Analysis of the Conception of the the Hero as Portrayed by Soldiers in War Films. I could have, because that's what it is about, but it impedes comprehension. It needs to be to the point and convey exactly what that person will read.

Writing a Good Introduction

The introduction should cover the same topics as your abstract but in a bit more detail. You also need to include:

1. Thesis statement
2. Overview of the study methods
3. Theoretical framework (if you have one)

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4. The reasons why the study has value to the research area you're contributing to

If you've finished your research be sure to give us a good idea about your findings. Many times, when beginning any writing project it is suggested that you start with a "hook" to get your reader interested in your topic, this is not necessary in a research paper. It can however, add to your paper. It's acceptable but not required. After covering everything mentioned above, provide a one paragraph roadmap of your paper. This gives us an idea of how you will attack the rest of the document we are about to read. For example:

"In the following pages I will first discuss the relevant literature and previously conducted studies that relate to my study about goldfish and their love for beer. Second, I then outline the method by which the research was conducted, followed last by a discussion of the results as well as future implications of the goldfish/beer relationship." You'll notice that I use "I" in that statement. It is perfectly acceptable to use "I" from time to time in a paper as long as you don't overuse it.

Protip

Don't write your introduction first. As it is a preview of the study it's usually best to write your introduction and abstract last.

Introducing the Topic of the Paper

Announce your research topic

You can start your introduction with a few sentences which announce the topic of your paper and give an indication of the kind of research questions you will be asking. This is a good way to introduce your readers to your topic and pique their interest. The first few sentences should act as an indication of a broader problem which you will then focus in on more closely in

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the rest of your introduction, leading to your specific research questions.

1. In scientific papers this is sometimes known as an "inverted triangle", where you start with the broadest material at the start, before zooming in on the specifics.
2. The sentence "Throughout the 20th century, our views of life on other planets have drastically changed" introduces a topic, but does so in broad terms.

   It provides the reader with an indication of the content of the essay and encourages them to

Consider referring to key words

When you write a research paper for publication you will be required to submit it along with a series of key words which give a quick indication of the areas of research you are addressing. You may also have certain key words in your title which you want to establish and emphasizes in your introduction.

1. For example, if you were writing a paper about the behavior of mice when exposed to a particular substance, you would include the word "mice", and the scientific name of the relevant compound in the first sentences.
2. If you were writing a history paper about the impact of the First World War on gender relations in Britain, you should mention those key words in your first few lines.
3. Read on.

Define any key terms or concepts

It may be necessary for you to clarify any key terms or concepts early on in your introduction. You need to express yourself clearly throughout your paper so if you leave an unfamiliar term or concept unexplained you risk your readers not having a clear understanding of your argument.

1. This is especially important if you are attempting to develop a new conceptualization that uses language and terminology your readers may be unfamiliar with.

Introduce the topic through an anecdote or quotation

If you are writing a humanities or social science essay you can find more literary ways to begin your introduction and announce the topic of your paper. It is common for humanities essays in particular to begin with an illustrative anecdote or quotation that points to the topic of the research. This is a variation of the "inverted triangle" technique and can generate interest in your paper in a more imaginative way and demonstrate an engaging writing style.

1. If you use an anecdote ensure that is short and highly relevant for your research. It has to function in the same way as an alternative opening, namely to announce the topic of your research paper to your reader.
2. For example, if you were writing a sociology paper about re-offending rates among young offenders, you could include a brief story of one person whose story reflects and introduces your topic.
3. This kind of approach is generally not appropriate for the introduction to a natural or physical sciences research paper where the writing conventions are different.

Establishing the Context for Your Paper

Include a brief literature review

Depending on the overall length of your paper, it will be necessary to include a review of the existing literature already published in the field. This is an important element of your paper which demonstrates that you have a strong knowledge and understanding of the debates and scholarship in your area. You should aim to indicate that you have a broad knowledge, but that

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you are engaging in the specific debates most relevant to your own research.

1. It is important to be concise in the introduction, so provide an overview on recent developments in the primary research rather than a lengthy discussion.
2. You can follow the "inverted triangle" principle to focus in from the broader themes to those to which you are making a direct contribution with your paper.
3. A strong literature review presents important background information to your own research and indicates the importance of the field

Use the literature to focus in on your contribution

A concise but comprehensive literature review can be a very effective way to frame your own research paper. As you develop your introduction, you can move from the literature to focus in on your own work and its position relevant to the broader scholarship.

1. By making clear reference to existing work you can demonstrate explicitly the specific contribution you are making to move the field forward.
2. You can identify a gap in the existing scholarship and explain how you are addressing it and moving understanding forward.

Elaborate on the rationale of your paper

Once you have framed your work within a broader context you can elaborate more fully on the rationale of your research and its particular strengths and importance. The rationale should clearly and concisely indicate the value of your paper and its contribution to the field. Try to go beyond saying that you are filling a gap in the scholarship and emphasize the positive contribution of your work.

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1. For example, if you are writing a scientific paper you could stress the merits of the experimental approach or models you have used.
2. Stress what is novel in your research and the significance of your new approach, but don't give too much detail in the introduction.
3. A stated rationale could be something like: "the study evaluates the previously unknown anti-inflammatory effects of a topical compound in order to evaluate its potential clinical uses.

Specifying Your Research Questions and Hypothesis

State your research questions

Once you have indicated where your research sits in the field and the general rationale for your paper, you can specify the research questions the paper addresses. The literature review and rationale frames your research and introduces your research question. This question should be developed fluently from the earlier parts of the introduction and shouldn't come as a surprise to the reader.

1. The research question or questions generally come towards the end of the introduction, and should be concise and closely focused.
2. The research question might recall some of the key words established in the first few sentences and the title of your paper.
3. An example of a research question could be "what were the consequences of the North American Free Trade Agreement on the Mexican export economy?"
4. This could be honed further to be specific by referring to a particular element of the Free Trade Agreement and the

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impact on a particular industry in Mexico, such as clothing manufacture.

5. A good research question should shape a problem into a testable hypothesis.

Indicate your hypothesis

After you have specified your research questions you need to give a clear and concise articulation of your hypothesis, or your thesis statement. This is a statement which indicates your essay will make a specific contribution and have a clear result rather than just covering a broader topic. You should make it clear briefly how you came to this hypothesis in a way which references your discussion of the existing literature.

1. If possible try to avoid using the word "hypothesis" and rather make this implicit in your writing. This can make your writing appear less formulaic.
2. In a scientific paper, giving a clear one-sentence overview of your results and their relation to your hypothesis makes the information clear and accessible.
3. An example of a hypothesis could be "mice deprived of food for the duration of the study were expected to become more lethargic than those fed normally"

Outline the structure of your paper

In some cases the final part of an introduction to a research paper will be a few lines that provide an overview of the structure of the body of the paper. This could simply give an outline of how you have organized the paper and how it is broken down into sections.

1. This is not always necessary and you should pay attention to the writing conventions in your discipline.
2. In a natural sciences paper, for example, there is a fairly rigid structure which you will be following.

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3. A humanities or social science paper will most likely present more opportunities to deviate in how you structure your paper.

Writing the title and abstract can be the easiest and most frustrating part of writing a research paper. There are two major things to keep in mind when writing your title and abstract:

Be clear and concise

You want everyone to know exactly what your paper is about simply by reading the title.

Write the title, abstract (and introduction) last

This may seem a little strange to a lot of people but it makes the most sense to write them once you understand what you studied, what your results were, and what you want your audience to take away from reading it.

Writing Qualitative Research Paper
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Systematic Ways to Process Information

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Abstract

The purpose of research is to collect data systematically to address an issue and analyze the data collected so as to make sense of the information. The process of understanding the context of the problem, the approach to studying it, the methods of gathering facts and figures related to the issue at hand and then reaching a conclusion to address the problem are all the ways of research methodology. Each step has its own significance; however with the advent of information technology, the access to data has become extremely easy leading to its own problems. The data to be collected should be looked at first in the light of what already exists and in all its different forms and then only the next step of collecting data primarily for the research should be undertaken. This is because the primary data collection can cost the researcher time, money and effort which may not be wholly necessary. Hence, the review of literature is the primary step to systematically process the information already available and to garner ways to extract that which is relevant to one`s research

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needs. This paper will look into the review of literature and how to go about conducting it in a planned manner to enable the researcher to save time and money and also to gather information that would be essential for his/her study purposes.

Keywords- Review of Literature, Systematic, Research, Bibliography, Search Areas.

Introduction

Research is an original contribution to the existing stock of knowledge making for its development (Kothari,2004). The systematic approach concerning generalizations and formulation of a theory is also research. As such the term 'research' refers to the systematic method consisting of defining the problem, formulating a hypothesis, collecting the data, analyzing the facts and reaching certain conclusions either in the form of solutions(s) towards the concerned problem or in certain generation for some theoretical formulation.[1]

All the steps enunciated above are critical to a logical reasoning and ways to resolve issues. While each has its own importance, increasingly, the easy access of the researcher to the World Wide Web through the means of information technology has led to a plethora of information sources that may or may not be relevant to the research. Another aspect is that with this vast knowledge source the, researcher may become confused and /or diverted from the main objectives of the research. Thus a systematic review of literature is an extremely important step for undertaking any research and it has its own way relevance.

What is Review of Literature?

According to Hart (1998) a literature review is an objective, thorough summary and critical analysis of the relevant available research and non-research literature on the topic being studied. Review of Literature is carried out by the researcher to

establish their reasons for undertaking the research and also to completely gauge the work that has already been carried out in that area of work by others in whichever form. The purpose of literature review is often to bring all related matter on the topic as one combined resource, thus bringing the reader up to date on the work done in the field and at the same time it may also elucidate the research objectives because of the clarity it brings to the topic.

A good literature review is not just a long boring list of citations and bibliography, it is well structured, systematic in its pursuit and easy to read and understand the connections to the topic.

Importance of Literature Review

A good literature review defines and limits the research topic for better probity. By studying the literature available on the topic, the researcher is able to grasp the historical perspective of the chosen area of research and understand how it has been dealt with at various stages of its evolution. Another important aspect of conducting a systematic review of literature is that it tends to avoid any duplication that may occur by following a step by step approach. A good review of literature provides the necessary direction for future research and also may throw up new research methods. Thus a well written review of literature can be critical, can be appreciative, can identify the gaps in the area of study that needs to be probed, can also suggest ways and means of carrying out research and carry the assessment of the researcher in it.

What is a Systematic Literature Review Approach?

A researcher will do well to follow a systematic approach towards the literature review initially. A systematic approach has several steps which will be listed later; however any researcher should clearly understand that carrying out a review of previously published literature is not creating a summary of all the work read

by the researcher. In contrast, it is an exercise to learn from the work carried out by others in the same field and get clarity on opposing viewpoints so that your research objectives are all the more distinct and the researcher would be able to actually add value to the existing body of knowledge through the research and not just re-invent the wheel. As per Morgan (2005) and Newman (2006), the following steps could be taken for a systematic literature review process:

1. Scoping the field – which involves initial understanding of the research topic and generalized understanding of the work done in it. The researcher should have some key phrases or identifying words in mind while conducting this step.
2. Developing the search strings- this is the step where the initial scoping leads to the researcher fine tuning into the relevant lines of further study. Needless to say this is more intense than the initial scoping.
3. Determining the search areas- with the development of search strings, the researcher will be more focused on the areas to search for which will yield relevant results for his/her topic. Thus in this step , the research becomes focused only on the work done in the field of work of the research. Here the researcher can make the summary of the relevant papers/articles and other non-research work that can assist the research topic.
4. Reviewing the results – in this step the researcher reviews the compilations of the step three and determines the lacunae which need to be filled up with primary data gathering using various tools.
5. Concluding the findings – by this step the researcher is able to clearly articulate the reason behind undertaking his

research since the data analyzed during the systematic review of literature will throw open avenues of further probing.

6. It is advisable that at this stage a matrix of sorts be prepared by the researcher listing down all the important literature and the learning from it which can assist the researcher. The possible structure can be:

Article title	Bibliographic details	Search string and source	What the article talks about	Relevance to the topic of the research

From the above compilation the next step of formulating the hypotheses and refining research objectives becomes very simple.

Conclusion

For any research to be carried out, especially qualitative researches, as for social sciences, the review of the literature are an important step. Sometimes with the difficulty of getting adequate and reliable sample size, relevant studies done in the area conducted in a systematic ways by weighing the pros and cons of each study and reaching conclusions, is the best way to conduct research. With the advent of the World Wide Web, the information availability due to the internet has become easy. Many search sites like ProQuest, Google, Google Scholar and EBSCO provide thousands of article links which can be relevantly searched only if a systematic method is adopted by the researcher. Ensuring that the research problem is clearly and concisely stated is one of the most important aspects of stepping into research. For this, a thorough and adequate study of the information available is a must. The researcher has to keep in mind that due to the excessive information availability, it is very

easy to just type in some keywords and gain access to multitude of resources. However, it is vastly more important that the step by step, systematic method of reviewing the data from a macro to a micro level; from a general to a specific string of searches is the best way to yield results that can be utilized gainfully. If done well, the literature review can itself become a publishable article as it can take the reader through the journey of the topic`s origin and its progress through the eyes of various authors, reaching a conclusion drawn about the topic by the researcher, leading to further insights for a future research or a clearer understanding in the present. Blindly citing hundreds of articles just for the purpose of creating a bibliography should not be the aim of the researcher. Remember, research`s purpose is to add to the existing body of knowledge. A good literature review conducted in a systematic manner by processing all available information can be extremely useful in highlighting the thought process of the researcher and how the research is going to be relevant to the universe.

In the end, a good literature review should be written with the author`s insights, in his/her own words, avoiding slangs and local terminology, with clarity of intent and purpose, being respectful in the language even when being critical of another`s work and essentially leading the researcher to formulate the next step in the research process with much more precision and lucidity.

References

1. *Booth Andrew, Sutton A, Papaioannou D, " Systematic Approaches to a Successful Literature review", 2016,Sage Publications,UK*
2. *Cronin P,Ryan F,Coughlan M," Undertaking a Literature review: a step-by-step approach", British Jornal of Nursing, 2008, 17:1.38-43*

3. *Hart C ,"Doing a Literature Review.",1998, Sage Publications, London*
4. *Kothari C.R, "Research Methodology Methods & Techniques", Second Edition, New Delhi: New Age International publisher, 2004, PP. 1-2.*
5. *Morgan, C,"Structured Literature Review Student Guidelines". ,2005, Cranfield University, School of Management.*
6. *Neuman, W,", Social Research Methods Qualitative and Quantitative Approaches",2006,.6th ed. Boston: Pearson Education, Inc.*
7. *Webster Jane and Watson R.T, "Analyzing the past to Prepare for the future: Writing a Literature review", MIS Quarterly, Vol.26, No.2, Jun 2002, pp xiii-xxiii*

Writing Qualitative Research Paper
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Importance of Research Study

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Abstract

Research is a systematic and scientific search of pertinent information on an important and specific topic. This is a source of various facts and that reaches the new conclusion. Psychologically research findings are able to explain individual's behavior that includes how people think and act in certain manner.

In a research paper or academic writing researcher or investigator used to independent research in a particular topic and write a description of the finding revealed from that work. A research paper is an expended write-up that represents interpretation or evaluation by a researcher. The research papers involve surveying a area of knowledge in order to find out the best possible data and information in that particular specific field.

The objective of this research paper is to analysis of importance of research paper. It also examines the mistakes in writing research paper and to study the importance of digital techniques in research paper.

Keywords: Research, Writing, Analysis, Professional, Importance

Introduction

Research means to explore something new or do the search again. Research serves as an impregnable tool for almost every areas of society. It has most valuable implication in academics especially for academicians, research scholars and research based institution. Research is also never one time activity but it is dynamic that changes accordingly as per the time, resources and requirements.

Research paper is art of writing brief information about particular topic. It is required that a student provide relevant information that is applicable to the research to the research paper topic. Furthermore this information should come from reliable sources backed with a thought list of references and citations.

Objectives of the Study

1. To analysis of importance of research paper
2. To examine mistakes in writing research paper
3. To study the importance of digital technique in research paper

Importance of Research Paper

Knowledge of facts and improvement in learning

The research is required not just for research scholars and academics, but for all different kind of professionals. Among academics and professionals, finding a specific topic to discuss and write about should go beyond personal experiences. Research study becomes a must to ascertain if later ideas are supported by previous studies .The ideas always still need proof to be considered as knowledge. Research is the best key factor of efficient learning. Many studies on the effects of sleep on human brains are among the many research topics that have already

seen examined by academics in various universities. A myriad of research ideas likewise awaits the attention of avoid scholars and writers. The Real research is improving knowledge as well as in efficient learning.

Easy for Success and Job Search

Research has important role in different areas. Many successful firms, such as those that produce consumer goods and items, invest in research study and development. Different areas are like industries with science, engineering process like agriculture, food and beverage, manufacturing, healthcare and pharmaceutical, computer software, semi-conductor, information and communication technology, construction robotics, medical, aerospace, aviation and energy etc. have high research and development expenditure. The unemployed can also benefit form doing research. Through job posting sites or employment agencies, but it can inform them if work opportunities are legitimate without research work the gullible.

Easy to Understand Various Issues

Some film and t v actors would take time to interview detectives, boxers, scientists, business people, criminals and teachers, among others. Others would even immerse themselves in situations that would make them understand personal and social issues like living behind bars or in a drug rehabilitation centre. Many person would read biographies, journals or literature, have a better context or view of the story, research can shed light on issues we didn't even know existed, and can raise questions we hadn't realized even needed asking. The importance of research for ICT teachers-"The internet provides people a convenient way to do research."

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A way to Prove Lies and to Support Truths

Ever experience feeling that your mate is having an affair behind your back? What should research have to do with that condition and situation? Professional and credible journalists undertake thorough research to establish the veracity of their stories. With the use of internet technology and social media, Pseudo journalism has become a social concern. Fake news took center stage during the 2016 presidential campaign period in the world. Social media, especially facebook, serve as the source of news for over 65 percent of adults. Besides the platform, fake and wrong news have become profitable for pseudo journalists whose main goal is to attract reader clicks that lead to google adsense revenues. The truth is integral to the process of research, for it is fueled by an inquisitive and critical mind. Genuine journalists do not rely on imagination for their news reports nor do they avoid doing research. They are messengers of truth, not lies. Through the internet is a valuable tool, it is not the only research skill a person needs in order to find the facts. Using research papers can help you not only find the information you need, but also find information that you can trust.

A Seed to Love Writing, Reading, Sharing Valuable Data and Its Analysis

The research Study entails both writing and reading. There are two literacy functions that help enable comprehension and computation without these abilities, this is less likely for anyone to motivate and get involved in study of research. Reading opens the mid to a vast horizon of knowledge, while writing helps a reader use her/ his own perspective and transform this into a more concrete idea that ‘s understands. A part from reading and writing, listening, and speaking are also integral in conduction

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research. Listening to experts of research discuss the advantages and befits of their research studies helps the listener to examine a particular issue and write about this analysis of study.

Exercise and Nourishment for the brain

Researches or the thinking process is the food for brain; allows creativity and logic to remain active, indeed, research and doing research encourage people to explore possibilities, to understand existing issues, and to disclose truths and fabricated one. Without research, technological advancement and other developments could have remained a fantasy, reading, writing, observing, analyzing and interacting with others facilitate an inquisitive mind' quest for knowledge and efficient learning . Research serves as an instrument to achieve that goal.

Common Mistakes in Writing Research Paper

The most common mistakes research scholars make when writing a research paper are; over-length papers, letting your deadline slip, unreadable and proofreading papers. There are some research papers that have plagiarized texts and content, not citing recent work or works in top conferences, incremental extension of the author's previous work, journals, poor organization, no natural flow of paragraphs, irrelevant information, figures/charts that do not look good or are too small, being afraid to ask for help, trusting the computer to spell-check, failure to make appropriate connections between the thesis statement and supporting statements. All these comman mistakes are discussed in detail and the ways to avoid them may be; use your grammar checker, but avoid your own decisions, make sure your final version is a clean copy, look for and fix your common grammar and mechanics errors, not backing up your documents, ask a friend with strong writing skills for feedback on your draft, but don't

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expect friends or family to take responsibility for editing your work. Research scholar should make an appointment with a writing instructor in learning services for some advice during the organizational or draft phase of your work and many more.

Importance of New Techniques in Research Paper

Innovation techniques to help off predict in their own future actions. In any case, the world of market research is shifting from self-reporting techniques (surveys, focus groups) to observational research methods whenever possible. The date is much more reliable.

Smart phones and tablets are capturing the world. These gadgets have become a preferred platform for many applications available in the markets, including market research. Examples of how these devices are being used in market research include: text messaging surveys and voting (SMS surveys)- one good example of this is a company called “Poll Everywhere” . It allows seminar attendees to vote and respond to poll questions via SMS (text messaging).

Various mobile surveys are one designed particularly for the smart phone form factor. In India, many companies working on this, such as opinion meter and opinion surveys. These surveys could be web- based, optimized for mobile phone and they could be many applications built specifically for Android, iOS and windows based mobile phone operating systems. Advance mobile phone market research techniques could be influence by mobile phone location (GPS) information to trigger questions or simply track movement over time. For example, we can imagine a survey question that only appears when the phone knows the user of mobile is at the fuel filling station. Mobile ethnography used data and information like awareness of location, research scholar are

able to collect rich relevant data (using smart phones) about behaviors, allowing them to really understand the lifestyles and habits of subjects.

Virtual shopping always involves the application of virtual store simulation to copy a shopping experience for persons- a good way to test things retail issues like store layout, product placement packaging etc. Once again, the idea is to replicable a real situation for research subjects and observe behavior, as opposed to asking them what they think they will do. Digital collaboration tool are often much cheaper than physically gathering people. The allow research scholar to gather people from broader geographies much easier. Social media is playing a vital role from social media websites. Looking at how many times a certain product or news story is shared across sites.

Conclusion

The research is the foundation of knowledge and fountain of gain .it is an important source of providing guidelines for solving different businesses, social problems and governmental issues. Research paper helps us to understand and possibly even solve existing or possible problem. This could be anything from social issues to scientific or medical brake thoughts. Government organizations, institutions or individuals carry out research every time in order to conclude about strategies and policies.

References

1. *Christian Times Newspaper (2012) Reported on 12 March Chaos in Chicago.*
2. *Dorothy Mikuska - (2016) why students should still write research papers. Teach though staff.*
3. *Jan Priddy – (2015), Pingback: why students should still write research papers. Teach though staff.*

4. *Learn Zarah (2017) Six reasons why research is important to teaching to see org.*
5. *Mason Porten (2015) Why do we write research papers, Caltech.*
6. *Social News and UGC Hub (2016) News on legitimate media outlets.*
7. *Gohar Nayab-(2015) The Research Project, University and research, Ministry of Education, Delhi.*

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Reviewing the Literature: A Critical Review

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Abstract

Every researcher has to go through the phase of reviewing the literature available in that field. This process is called 'literature review' or 'review of related literature'. Mostly researchers have done literature review in a hurry and the outcome of their research work is of no value. There are much misconceptions prevalent in the researchers' fraternity about the seriousness of literature review. Generally, researchers simply accumulate previous studies done in their field without much effort. By doing this they have thought that they have done what is required. But simply they have done only the very first step of the literature review. The present paper has dealt with the basics of literature review, why it is important, what are the steps of literature review process and what are the common shortcomings, which has to be avoided to produce a good literature review. A good literature review is the essential demand of the research

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work. It must analyse critically a segment of a published body of knowledge through summary, classification and comparison of prior research studies, reviews of literature and theoretical articles. Then only the findings of the research can be worthy in true sense.

Keywords: Literature Review, Misconceptions, Critical Analysis, Theoretical Articles.

Introduction

A literature review is a description of the literature, relevant to a particular field or topic. The 'literature' in a literature review, however refers to all the previous research and scholarship on a particular topic. It refers to a collection of published information / materials on a particular area of topic or research, such as books and journal articles of academic value. 'Review' is the researcher's explanation of what the literature says. In other words, a literature review or reviewing the literature is a written work that performs a thorough, 're' 'view', 'overview' or 'look again' of past and current works on a subject, issue or theory. Literature review is the most important part of thesis, dissertation or a research project or paper but simultaneously it is the most misunderstood and the neglected one.

What is a Literature Review?

A literature review identifies, evaluates and synthesizes the relevant literature within a particular field of research. It illuminates how knowledge has evolved within the field, highlighting what has already been done, what is generally accepted, what is the current state and what is the emergent thinking on the topic. A literature review has an organizational pattern and combines both summary and synthesis of the previous studies. Whereas a summary is a recap of the important information of the source, a synthesis is a reorganization and a re-

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shuffling of old material or combine new with old interpretations, or it might trace the intellectual progression of the field, including major debates. Thus, laying a foundation for present research. The essence of literature review can be summed up as an evaluative report of information found in the literature related to the selected area of study. The review of literature should give a theoretical base for research and help the researcher to determine the nature of his research. It is more than the search for information and goes beyond being a descriptive annotated bibliography. Relationships between the prior published literature must also be identified and articulated in the ongoing field of research. Thus, a literature review demonstrates a familiarity with a body of knowledge and establishes the credibility of the research work. It summarizes prior research and states how the research project is linked to it. It integrates and summarizes what is known about the subject.

It can be summed up as literature review appraises, encapsulates, compares, contrasts and correlates various scholarly books, research articles and other relevant sources that are directly related to the current research. It demonstrates that the researcher has learnt from others and the current research is a starting point for new ideas.

A literature review is not a “laundry list” of everything written on a topic. It does not lack the organization guided by thesis or research questions and synthesis and critical evaluation of literature. A good quality literature review means appropriate breadth and depth, rigor and consistency, clarity and brevity, effective analysis and synthesis. An effective literature review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research

exists and uncover areas where research is needed (Webster and Watson,2002).

Definitions

The literature review accomplishes several important things, it shares with the reader the results of other studies that are closely related to the study being reported (Fraenkel & Wallen, 1990). It relates a study to the larger, ongoing dialogue in the literature about a topic, filling in gaps and extending prior studies (Marshal & Rossman, 1989). The review of the literature provides the background and context for the research problem. It should establish the need for the research and indicate that the writer is knowledgeable about the area (Wiersma,1995, P.406). From the above definitions, several characteristics of literature review can be understood as-

1. A body of text that aims to review the critical points of current knowledge on a particular topic.
2. A comprehensive survey of publications in a specific field of study or related to a particular line of research.
3. A summary and interpretation of research findings reported in the literature.
4. A process and documentation of the current relevant research literature regarding a particular topic or subject of interest.

Types of Literature Review Sources

A researcher has to be known about the sources from where he can review his/her topic. There are several sources but most common ones are listed here as advocated by Sonia Martinez in her article, “How to write an effective literature review”

1. Journal articles (surveys and research papers)- Provide technical up-to-date information about a research topic.

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2. Books- Recent research monographs can be useful in literature review, but one must not include citations of text books.
3. Conference proceedings- They provide valuable information about the latest/unpublished research. In general, less reliable than a journal article.
4. Government or corporate records- Depending on the field of study can be a useful source of information. They may outline general research lines a particular organization is interested in funding.
5. Theses and dissertations- They can be useful sources of information. However they can be difficult to obtain, parts of the research presented may have to be treated with caution.
6. Specialized magazines- Sometimes these are considered as reputable as a journal. Other types of magazines can provide a good starting point to find more reputed work.
7. Other sources include newspapers and internet, these can point to the more reputed sources.

Types of Literature Reviews

A researcher must be aware that there are several types of literature reviews for writing a good one. Each has its own approach, analysis and purpose. There is a glimpse of each one by one-

Systematic Review

It is important to health care and medical trials and other subjects where methodology and data are important. Through rigorous review and analysis of literature that meets a specific criterion, the systematic review may include meta -analysis and meta-synthesis.

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Quantitative or Qualitative Meta-Analysis Review

Both are thorough and comprehensive in condensing and making sense of a large body of research. The quantitative meta-analysis reviews quantitative research s objective and includes statistical analysis. The qualitative meta-analysis reviews qualitative research is subjective and identifies new themes or concepts.

Narrative Review

It often appears as a chapter in a thesis or dissertation. It describes what related research has already been conducted, how it supports the thesis and how the thesis fits into the research in the field.

Critical Review

It is like narrative review but requires a more detailed examination of the literature to compare and evaluate several perspectives.

Scoping Review

It is often used at the beginning of an article, dissertation and research proposal. It is conducted before the research begins and sets the stage for the present research by highlighting gaps in the literature. It explains the need for the research about to be conducted.

Conceptual Review

It categorizes articles according to concepts, categories or themes. It identifies the current 'understanding' of the given research topic, discusses how this understanding was reached and attempts to determine whether a greater understanding can be suggested.

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Strategies for Writing the Literature Review

Writing a good literature review demands a proper strategy. Several steps have to follow for a proficient piece of work. These steps of the literature review process are-

Planning

First step is to plan about writing a review of related literature. It involves identifying the focus, scope and discipline of the review. One has to sort and categorize all the information here in addition to eliminate irrelevant information.

Reading and Research

This step includes collecting and reading recent updates on present research. A skilled researcher selects only those sources that are most relevant to his project. It consists of answering the following questions, such as what is the principal point and conclusion of the researches available and the most important one how does previous studies add to or provide differences to the present work.

Analysing

This is the most productive step. It consists of summarizing, synthesizing, critiquing and comparing the available resources to assess the field of research, as an integrated whole. Here the researcher tries to answer the questions like what are the key arguments, key characteristics and key concepts prevalent in related literature. And what common methodologies are used to get the answer of research questions.

Drafting

In this step researcher organizes the material in a meaningful manner. This section addresses the following topics such as thesis statement, organization, introduction, conclusion and citations. Thesis statement offers an argument about the literature. Here researcher relates the literature to the larger aim of

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the study. Citations must be taken proper care of, like paraphrasing key ideas, maintain accurate bibliographic records and to avoid plagiarism.

Revising

This is the last step in this process. Researcher revises and finalizes the structural, stylistic and grammatical issues here. At this stage literature review has got its proper form with utmost accuracy if above steps must be taken in mind.

Purpose

A good literature review must serve some purpose like-

1. to survey the literature in chosen area of study
2. to identify major seminal works
3. to search main methodologies and research techniques
4. to recognize main ideas, conclusions and theories and establish similarities and differences to synthesize the information in that literature into a summary
5. to present the literature in an organized way
6. to critically analyse the information gathered by identifying gaps in current knowledge
7. to provide a context for present research
8. to determine the ways to interpret prior research
9. to establish areas of prior scholarship to prevent duplication of effort
10. to ensure that the research work is adding to the understanding and knowledge of the field

Importance of Literature Review in Research

The literature review is integral to the success of academic research. A major benefit of the review is that it ensures the reachability of the research topic before proper research commences. It is the progressive narrowing of the topic through the literature review that makes most research a practical

consideration. It helps readers understand what is known about a topic without having to find and read through multiple sources. It can also help the researcher learn about his topic while in the process of preparing the review itself. In the act of research and writing the literature review, the researcher gains expertise on the topic. It creates a rapport with the targeted readers, helps to avoid incidental plagiarism and sharpens the focus of the research. When researcher assembles outside sources, he condenses, evaluates, synthesizes and paraphrases the gist of outside sources in his own words. Through this process of winnowing, he must be able to place the relevance of his research in the larger context of what other researchers have already done in the past. The literature review helps to rationalize the need of researcher to do this particular research. It is essential in helping the researcher to shape and guide his research in the direction he may not have thought of by offering insights and different perspectives on the research topic.

Common Shortcomings in Writing a Literature Review

A researcher must have several attributes like organizing power, persistence, patience, enthusiasm and communication for writing a good literature review. If any one of the above is missing, then a literature review ends up in a messy write-up. Generally, a novice researcher prepares a piece of work which is a list-like writing that lacks synthesis. Another major shortcoming in writing this sort of work is that it is not being sufficiently critical. It must be in the form of an argument, which should provide a detailed justification for the current research. A common weakness of a proficient literature review is that it does not discriminate between relevant and irrelevant materials. A literature review is not just supposed to simply demonstrate how much he has read, but must provide a description of how certain parts of what he has read

provide the foundation for, motivate and frame his research. Most of the literature reviews lack a clear organisational structure and lose their prime focus. They mostly rely on such materials that are likely to be out-of-date. This should not be the case. Another common mistake is to spend too much time summarizing the paper and not enough time assessing or thinking about the paper. These should be weighted almost equally. According to D.J.Bem (1995), literature reviews are at risk for producing mind-numbing lists of citations and findings that resemble a phone book-impressive case, lots of numbers, but not much plot. A skilled researcher must keep in mind these common mistakes and by avoiding them one can produce a proficient piece of writing.

Conclusion

If one will go through the entire article, he/she must aware about the essence of writing literature review. Literature review is the back bone for the solid foundation of any research work. If a research has been done with poor review of literature, it can merely serve any purpose. One may grabbed in the duplication of any prior work, if he/she has not sorted out any gap in the previous work. Hence a good literature review is the foundation stone of the premises of research. The prime motive of research work in sciences as well as social sciences is to serve the nation as well as humanity by its findings. This larger goal can only be met by the well analysed and documented review of literature.

References

1. *D. J. Bem. (1995). Writing a Review Article for Psychological Bulletin*
2. *Fraenkel & Wallen. (1990). How to Design and Evaluate Research in Education. McGraw-Hill Publishing Company*

3. *Marshall & Rossman. (1989). Designing Qualitative research. Sage Publications*
4. *Webster & Watson. (2002). Analysing the Past to Prepare for the Future : Writing a Literature Review, MIS Quarterly*
5. *Wiersma, William. (1995). Research Methods in Education. Allyn & Bacon*

Web Access

6. *https://googleweblight.com/i?u=https://www-uq.edu.au/studentservices/learning/lit-reviews-commonproblems&hl=en-IN*
7. *https://www.lib.uwo.ca/tutorials/typesofliterturereviews/index.html*
8. *https://googleweblight.com/i?u=https://libraryguides.missouri.edu/literaturereview&hl=en-IN*
9. *https://googlewblight.com/i?u=https://www.monash.edu/rlo/graduate-research-writing/write-the-thesis/introduction-literature-reviews&hl=en-IN*

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Plagiarism: A Curse to Scientific Research Writing - A Growing Trend

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Abstract

A research publication is the highest level of dissemination of research findings. This act carries with it social and ethical responsibilities on the part of the author(s). Peer reviewers must be alert to situations which can compromise the integrity of authors seeking publication of their research findings. Scientific and scholarly publications, defined as articles, abstracts, provide the main vehicle to disseminate findings, thoughts, and analysis to the scientific, academic, and lay communities. For academic activities to contribute to the advancement of knowledge, they must be published in sufficient detail and accuracy to enable others to understand and elaborate the results. However, the process of writing scholarly papers for publication is challenging as it requires one to move from spoken and written

words to the arena of substantive evidence in attempts to make logical argument

Plagiarism is representing someone else's ideas, words, statements, or other work as one's own without proper acknowledgement or citation. Plagiarism can happen intentionally or unintentionally so it's good to know how to recognize what constitutes plagiarism. Some examples of plagiarism include:

Copying word for word or lifting phrases or a unique word from a source or reference, whether oral, printed, or on the internet, without proper attribution. Paraphrasing, that is, using another person's written words or ideas, in one's own words, as if they were one's own thoughts. Borrowing facts, statistics, graphs, or other illustrative material without proper reference, unless the information is common knowledge, in common public use.

Though plagiarism is an unintended behavior. But it can tarnish the image of an author very badly. Reputed journals consider plagiarism as a highly unethical practice and they strongly depreciate such behaviors. Concern about plagiarism in the international community has led to the development of guidelines by Committee On Publication Ethics (COPE).Plagiarism is difficult to detect and poses significant threat to the health of scientific research.

The manuscripts containing plagiarized text and fraudulent data distort scientific records. The editors usually are contended with finding out and rejecting manuscripts containing extensive plagiarism, but something more needs to be done.We should therefore educate young scientists about plagiarism and other publication misconducts. The reason of plagiarism by students may be lack of awareness on appropriate referencing and lack of knowledge on what constitutes plagiarism. It is

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responsibility of the writer to be very careful during preparation of manuscripts and revisions.

Borrowing facts, statistics, graphs, or other illustrative material without proper reference unless the information is common knowledge, in common public use. The reason of such behavior is not usually obvious. Easy availability of personal computers has led to widespread dissemination of research literature. As a result, young scientists are now publishing their research more frequently and efficiently. At the same time, this has increased the tendency to submit hurriedly prepared, poorly drafted and even illegitimate publications. Use of some amount of copy–paste followed by modifications during preparation of a manuscript seems to be common. Therefore, the researchers, should be educated continuously about ethical research writing.

Writing Qualitative Research Paper
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Guiding Points to Remember While Writing a Scientific Research Manuscript

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Abstract

Although, the exchange of information in the discipline of science usually focuses more on the content rather than writing style, it is important that the research work and the findings be present in already established conventions in an appropriate style. Whether the audience consists of readers or reviewers, a clear and concise impeccable writing style helps to convince them of one's work's worth. A good research paper or an article is an unrelenting investigation about a particular and specific subject where the author is not merely answering to the query, but also ensuring that the statements made in there are valid and there the research aspect comes into play. The purpose of this article is to guide and give an idea to writing about chemistry write-up. This article is not an inclusive writing reference, and most likely may not address specific query that arises, rather it introduces some

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major issues in writing about chemistry and directs you to some outstanding resources. This paper attempts to answer the elements of a research paper provides a summary on the fundamentals, focuses on the main elements and elucidates them in detail.

Keywords: Article, Research Paper, Scientific, Introduction, Experimental Section.

Introduction

A scientific research paper is like a treatise, a statement that supports the argument one has developed carefully by using the information from different sources or own experimental work and presented for open discussion & debate. The major goal behind writing a research paper is not to simply articulate but to give an idea about the topic and describe the scientific process behind the work. Before writing, one has to separate the wheat from the chaff while compiling the research data and put only the relevant facts in the paper. The information provided in the paper may be background information, giving a summary of the historical background of the work conducted with some supporting information. Sometimes, authors add opposing information to counter their work, which further validates and authenticates the opinion of the author about his research content. Scientific research articles also provide a scheme for researchers to communicate with other regarding the finding of their research. For writing a paper, the author presents the research in a systematic, methodical and logical manner in a standard scientific format so that it can effectively communicate its findings to the broad community of scientists and researchers in an unvarying and uniform manner. A research paper primarily includes the title, author/s detail, institutional affiliation, abstract, keywords, introduction, literature review, materials, and methods/parallel

experimental section (Some Journals require this section to be at the end), results and discussion, conclusion, acknowledgments, references and other supporting Information.

Step 1: Selecting a Title

The title should be succinct, not so technical, and accurate and specific enough to describe the subject matter of the research as it is the first thing that gains reader's attention. A trick to narrow down the title is to focus on a particular aspect of the subject by asking questions like why? How? Who? And When? A general thumb rule is that it should contain the keywords describing the investigation. A majority of audience search the paper via an electronic database, so the title must have appropriate keywords for the intended audience. However, sometimes a title that sums up the results is more effective. Hence, the title must be informative, clear, descriptive yet concise, with less of technical terminology and abbreviations.

Step 2: Authors' Names and Institutional Affiliations

The authors' names (primary author first, the one who conducted the experimental work and wrote the manuscript) and institutional affiliation should place below the title (as per the demand of the Journal). When more than two authors are there, then their names are separated by commas and for the last, which is separated from the previous name by the word "and". The name of the institution of each author where the work has been conducted should be indicated along with contact details of the author/s. An email addresses or phone number of the corresponding author can also be included in a footnote/endnote.

Step 3: Writing Abstract

The abstract is usually written at last by extracting the significant points from each section of the paper, providing a brief description of the purpose of the study with minimal experimental

results. The abstract comprises the first part of the document that addresses the problem, focuses on what the research is about and provides the necessary information. An abstract is the advertising text within the research article that gives the reader a preview to what the important findings an investigator have reached. In this way, it enables the other researchers and scientists to quick scan without going through the completely scientific literature. An abstract should be one paragraph of 100-250 words, which summarizes yet retaining the necessary concepts, the purpose, experimental procedure, results obtained and conclusions of the paper. The Abstract should not have long background information, references, citations, abbreviations or any sort of technical illustrations, figures or tables. It should not require any footnote. The language should be concise and easy-to-read. Once the abstract is complete, it is required to confirm whether all the information is given in abstract actually appears in the manuscript and agrees with it completely.

Step 4: Keyword List for Indexing

Use keywords wisely for indexing the paper, it may increase the ease of finding the paper by the interested audience. Avoid broad meaning words and those already used in the title.

Step 5: Convincing Introduction

The introduction part is a short segment designed to convince the readers of the relevance of the research. Satisfying facade, precision, piquancy, clarity in views, and logical competency of this section will insist the readers go through the subsequent sections of the article. An introduction section should be analyzed by formulating a question and discussing the significance of the research that was conducted by providing sufficient context and rigorously cited literature review of work for the reader to understand and evaluate the research area. The key

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is, to sum up, what the author knows about the problem before going with the experiments or studies. Then the discussion on the specific research content should be focused. At this point, the point of discussion should be expressed clearly and limited to one point as far as possible. At last, the recommendations for findings are explained in detail stating a hypothesis, which indicates the intention of the research. In other words, the aim of the study should be communicated well. Now, when the audience /reader goes through these steps which are well arranged in order, there will not be any problem for him to track and understand it his own perspective. However, inadequate and incomplete information, inability to clarify the problem and the probable solution or sometimes not disclosing the solution will keep the reader away who wish for new information from the literature.

In literal words, the Introduction must answer the questions: What is the context and problem to be solved? Are there any existing solutions already present? Which out of them is the best and economical? What are the limitations? What are the possibilities of achievement of the goal? how does this relate to other research? Ultimately, how will this study increase our knowledge? So, state the argument in the introductory paragraph and rest is a challenge to convince the reader that your argument is rational, reasonable, and goes with the facts. Apart from these, there is little other information which one must take heed of before writing the scientific article:

1. While giving details of the subject area, firstly general then specific information about the subject under investigation is given.
2. The aim of the study is well explained.
3. Abbreviations must be with their explanations.

4. References from updated publication and prestigious source books are for authenticity.
5. Confusing and contrast statements with confounding expressions should be avoided.
6. The sentences are logical, appealing, and comprehensible.

Step 6: Material and Methods/ Experimental Section

This section explains chronologically how the study has been conducted and problems are answered wisely. The author/researcher should give all genuine information regarding the experimental procedure, apparatus used, and different methods used to achieve experimental results without making it a lab manual procedure. In general, this section should be descriptive yet precise and concise enough so that it allows the fellow readers/researchers/scientists to evaluate the work and duplicate the experimental procedure using the same scientific techniques with ease for their own study. Skip over all explanatory information, If the experimental work has been done in natural habitat, the area of study, their locations also are mentioned. Here are the important things to keep in view while writing this section:

Experimental Design

One must describe the experimental design clearly such as what was done: how experiments were run, how very often the experiments and what and when the variables were measured. The major concern for doing this is to ensure that enough detail is provided to verify the findings of the study. Give references of a published paper as an alternative to describing if the procedure from the same which is used for this purpose.

Equipment/Apparatus/Chemicals

It is not required to list the types of equipment and the apparatus used. However, any specific modification in the equipment must be given in detail. If important, provide the

graphical illustration/figure/picture of the equipment or the apparatus. Mention any specific chemical used in the study.

Methods

Simply the name is sufficient if standard technique or method is used to perform the experiment. However, for modified standard techniques, describe the changes. Literature citation is a must for an advanced and unusual method used. Compute the measurements accurately (all metric) and include the errors too. If an experiment was conducted outside the laboratory, provide the dates and physical and biological characteristics including the name and location of the site. For tracking the variables like time, temperature, humidity, acidity, alkalinity etc, describe the analytical techniques with the citation. If a protocol is followed, include a flowchart, table or diagram to explain the method used. Mention the reason also to choose some specific measurements.

Materials

The materials used in the study have been already mentioned in the narrative as the experimental procedure is described in detail. Do not write results in this part. However, preliminary results used to plan experimentation can be mentioned.

Step 7: Result

This is the most important section, which is not for interpreting the results rather to report the findings without interpreting or evaluating. This is the section where the results of findings are presented. As the finding contribute to the scientific community for future work, clarity, specificity and authenticity is must. Here are the few points, one need to keep them in mind before writing this section:

1. Do not include all the data of the findings, only those that relate to the title. Do not manipulate the data to show positive

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results. Including negative results validates the authenticity of the paper, so do not be scared of showing them.

2. Do not present raw data instead use appropriate methods to present them? Do not try to manipulate the data to make it look like you did more than you actually did.
3. Do not be too concise. The first few lines of the paragraph in this section should state what the findings are. Few will bother the reader. Combine the use of text, tables and figures to condense data and highlight trends. In doing so be sure to refer to the guidelines for preparing tables and figures below.
4. Perhaps the best way to present relevant information about the result is to use graphs, figures, graphs and tables.
5. Do not repeat the data already presented in table or graph.
6. Do not discuss the results: leave that for Discussion section.
7. Data pull together in tables or figures must accompany relevant text in an easily understandable form.

Points to remember while making Table and Graph

Table

1. Include the title and column headings that give enough information to understand the table without referring to the text.
2. Table must read the elements moving down, not across.
3. Present the data in a table or in the text, but never present the same data in both forms.
4. Choose proper unit of measurement to avoid the use of an excessive use of digits.
5. Never include tables that do not relate to text.
6. If preparing a table, do not insert a graph highlighting the same data. Duplicate information may be penalized.
8. Table columns should specify the units employed under each heading.

Graphs

1. Provide each graph axis with a brief but informative title including both the variables and their units of measurement.
2. Don't fancy your report by figures if result can be summarized in one or two sentence.
3. Include figures those referred to in the text only.
4. The axis needs not to extend far beyond the range of the data and show the number of significant figures. Use reasonable scale.
5. Restrict use of unnecessary colors.

Step 8: Discussion

The discussion is the interpretation and reaching to conclusions about findings. It is the most important section, which is the easier section to write but harder to get that right. A large number of scientific papers get rejected due to weak discussion part, while writing this section few important points should be taken into consideration:

1. Interpret the results and discuss the principles reinforced/ supported/disproved and the generalizations drawn. Compare findings with previous work. In any case, evade unspecific expression that goes beyond what the findings support. When these points are addressed rest firmly on the results presented.
2. Quantitative descriptions are always preferred over qualitative.
3. Prevent any idea that confronts with the result.
4. A brief discussion of speculation rooted on facts is acceptable and open for discussion. Make sure the data obtained are consistent with the fellow investigators. End the discussion with a short summary on practical implication of the work and

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provide a conclusion concerning the significance and consequences of the work.

5. Revision of Results and Discussion is not just paperwork. You may do further experiments, derivations, or simulations. Sometimes you cannot clarify your idea in words because some critical items have not been studied substantially.
6. Discuss the limitations and constraints of experiments, questions left unanswered and negative results, agreement or disagreement with already published work. Emphasize the most significant results.

Step 9: Conclusion

This section sums up your argument with the brief recap of the findings with some important supporting facts. Do not simply summarize the points already discussed instead interpret the findings. In this way, it makes all the points clear to the reader about the data and the problem addressed in the study. A common mistake in this section is reiterating the abstract or just listing investigational results. If the paper has a commonsensical Introduction and an effectual abstract, do not restate any part of introduction in the conclusion in particular. Instead, focus on the outcome of the work and to what extent the results have succeeded in addressing the need of the study. Include future perspective at the end of the conclusion as an idea of how it can be developed more, what can be still done in relation to the problem tackled in the paper.

Step 10: Acknowledgements

In this section, give credit to the people who helped with the research. Give words of thanks to all those who provided technical help or assisted with the manuscript. Most importantly, thank the agency if your work is supported by a grant.

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Step 11: Literature Cited / References/ Bibliography

In this section, all published information about the author and original study is provided. It is to note here that the Literature Citation includes only those references that were actually cited within the paper. Any other information that did not mention in the paper is not incorporated in this section. This is why, this section is strictly called "Literature Cited" instead of "References" or "Bibliography".

The system of citing references in journals is quite picky and varies with the particular publisher. The standard for Literature citations, symbols, and abbreviations is that adopted by American Chemical Society (ACS). The ACS Style Guide lists all the required formats and provides easily.

Additional Tips for the Authors

1. Scientific writing must be accurate and concise. Avoid phrases as "it is believed that" or "scientists believe.
2. Avoid Superfluous words such as “amazing, interesting, surprising, huge, very, vast, incredible” etc. in scientific writing.
3. Papers should maintain the preferred past tense in the introduction and discussion sections of papers. However, present tense can be used when stating generalizations or giving conclusions.
4. Both the subject and the verb of a sentence should be either singular or plural.
5. Avoid the sentences starting with “There is”.
6. Use more precise words than “excellent and moderate”.
7. Use more formal and easily communicable expressions.
8. The word ‘treated’ can be substituted for ‘reacted ‘ to make writing in chemistry more formal.
9. Don't Plagiarize

References

1. *Alexandrov AV. How to write a research paper. Cerebrovasc Dis. 2004;*18*: pp135–8.*
2. *Burgdorf WH. How to get your paper accepted in an English-language journal. J Dtsch Dermatol Ges. 2004;*2*: pp. 592–596.*
3. *DeMaria AN. How do I get a paper accepted? J Am Coll Cardiol. 2007;*17*: pp 1666–1677.*
4. *Fried PW, Wechsler AS. How to get your paper published. J Thorac Cardiovasc Surg. 2001;*121*: pp 3–7.*
5. *International Committee of Medical Journal Editors. Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication. Updated April 2010*
6. *Lundberg GD. How to write a medical paper to get it published in a good journal. MedGenMed. 2005;*4 *pp 36-38*
7. *Murray R. Finding a topic and developing an argument. In: Murray R, editor. Writing for Academical Journals. Open University Press; 2005. pp. 67–98.*
8. *Thompson A. How to write an English medical manuscript that will be published and have the impact.Surg Today. 2006;*36*, pp 404–409.*
9. *Setiati S, Harimurti K. Writing for scientific medical manuscript: A Guide for preparing manuscript submitted to biomedical journals. Indonesia. 2007;*30*, pp 50–55.*
10. *Sutherland LR. How to get your paper published: confessions of an editor. Can J Gastroenterol. 2003;*17 *pp 279.*
11. *Vernon Booth:Writing a scientific paper. Biochem Soc. 1975;*3 *pp 1–26.*
12. *Yasar A, Erdemir F, Parlaktas BS, Atilgan D, Koseoglu RD, Saylan O, et al. The effect of carvedilol on serum and tissue*

*oxidative stress parameters in the partial ureteral obstruction-induced rat model. Kaohsiung J Med Sci. 2013;*29*. Pp 19–25.*

13. *Wen JG, Chen Y, Frøkiaer J, Jørgensen TM, Djurhuus JC. Experimental partial unilateral ureter obstruction I. Pressure flow relationship in a rat model with mild and severe acute ureter obstruction. J Urol. 1998;*160 *pp 1567–1571.*
14. *Welch HG. Preparing manuscripts for submission to medical journals: The paper trail. Eff Clin Prac. 1999;*2*, pp 131–137.*
15. *www.tbmm.gov.tr/kanunlar/k5237.html.*

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Principles and Practices of Data Collection in Research on Life Sciences

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Data and its Types

Data are generated as an outcome of the process of observations of the experiment or a scientific study of a phenomenon and its consequent recording. Data are usually obtained on such aspects of the scientific study or experiment which may either be measured or quantified. It is of many types on the basis of i) nature of variable ii) kind of characteristics that are observed, and iii) source from where it is collected.

Types of Data on the basis of nature of variable:

Continuous Data

It is based on a continuous variable whose values are quite precise and close to each other yet they are distinguishably different from each other, and it also assumes the finest unit of measurement. Finest in the sense that it enables measurement to the smallest degree of precision. There exist so many high-tech devices and gadgets for measuring such characteristics to any desired level.

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Discrete Data

It represents the values of a discrete variable and generates fixed values, usually in integers of 1,2,3 and so on. The discrete data are essentially count data as it is an outcome of counting the number of species, items, organs or organisms which possess or do not possess the particular characteristic under the scientific research.

Types of Data on the basis of kind of character:

Quantitative Data

It is the outcome of a variable which is essentially quantifiable in definite units of measurement. The quantitative data may either be the outcome of observing a certain characteristic of a continuous variable or that of a discrete variable.

Qualitative Data

These data pertain to qualitative features of the subject matter, organ or organism under research study. These do not relate to variables which give rise to numerical values. It can further be differentiated as nominal data and rank data. Nominal data are the result of classification of a number of species or items observed on the basis of some quality characteristics in two or more categories. Rank data are the result of a process of assigning ranks to specify order in the list of integers. The order of assigning ranks may be ascending or descending. The ranks are decided on the basis certain specified levels of quality traits.

Types of Data on the basis of source of collection:

Primary Data

It comprises of the information or data recorded by the researcher for the first time or first hand, while performing some scientific research. It is the data obtained in the actual

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research work which may be performed either in the laboratory or the field by using appropriate scientific research designs.

Secondary Data

When a researcher uses data which has already been collected by others such a data is designated as secondary data. It is available in research papers, manuals, books and other published research works.

Requirements of Data Collection

The basic requirement for any biological research is observation at the time of execution of the research design. The observations of the problem or any scientific study and subsequently explain such questions like what, why and how often provide the explanation in the form of a hypothesis. A hypothesis is put forth as a solution to a problem or as an explanation for an observed event. It is statement making a prediction that an event will occur under stated and specified conditions. A hypothesis should be one that can be tested. All that is required is to conduct a well designed and controlled scientific study to collect evidence in the form of valid data to support the hypothesis. The data collected from the experiment are subjected to statistical analysis which would test the null hypothesis. The result of statistical test of significance calculates the probability for occurrence of null hypothesis. If the probability is very low, lower than the level of significance, null hypothesis stands rejected. The rejection of null hypothesis leads to suggestion that information collected supports hypothesis. On the other hand, if the statistical test gives probability of occurrence of null hypothesis equal to or greater than the level of significance the null hypothesis cannot be rejected. The failure to reject null hypothesis leads to the

suggestion that the information collected from the experiment is insufficient to draw valid inference.

Data Collection Tools and Equipments

Data collection in biological sciences employs several different kinds of tools and equipments involved during the execution of research design. An exhaustive list of such equipments including the glassware and many other laboratory apparatuses involved for the execution of research design is prepared beforehand. There are many diverse disciplines in life sciences such as microbiology, ecology, cytology, pathology, anatomy, genetics, ethology, taxonomy, biotechnology, toxicology, parasitology, immunology, embryology, paleontology, phytosociology, ichthyology, ethnobotany and so on. Therefore, a wide range of tools and equipments including the latest modern gadgets and equipments are employed to execute the research designs in such disciplines. To name a few such devices are spectrophotometer, respirometer, incubator, digital devices like altimeter, photographic camera, calorimeter, microtome, centrifuge, potometer, microscopes of different types like electron microscope, transmission electron microscope, x-ray diffraction microscope etc.

Data Collection Techniques

The research works in life sciences require a systematic approach of data collection about the subject matter under the research study, data processing and data analysis to draw the valid and reliable inferences. The validity and accuracy of the final results depends on how well the data is obtained in the execution of research design concerning the problem. Therefore, the quality of data will greatly affect the conclusions and hence utmost importance and precautions must be exercised while collecting data in the research. As

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such it requires a high degree of skill besides following precautionary measures. Before following any methods of data collection the research study concerning the problem should be clearly specified and understood. If any similar research studies have already been conducted prior to the research study at hand then the researcher may give consideration to the secondary data already available, and accordingly redefine the objectives keeping in view the already published research work. The following methods of data collection are generally employed in life science research.

Direct Observation Method

In most of the research designs the researcher collects the requisite information of data through direct observations recorded during the execution of the research design. The observations are recorded either singularly or repetitively as per the nature of the research problem and consequently the research design. It is a very common method of data collection in various disciplines of life sciences.

Indirect Investigation Method

In some research problems the requisite information is obtained indirectly by way of investigation from the people who possess the required information regarding the scientific problem or inquiry. Though this method of data collection is not of common type in life sciences yet it is employed in some discipline of life science where information from knowledgeable persons is of paramount importance in reaching out the results of inquiry.

Whether direct or indirect method of data collection is employed more often it is necessary to resort to sampling in the research design since it is extremely cumbersome to extract exhaustive information in the execution of research

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design. There are many methods of sampling employed in data collection during the execution of scientific research design. Some of the commonly used sampling methods are given below.

Simple Random Sampling

It is a common method of sampling in the experiments as it allows the selection of all the n sample units independent of one another. The items or features that get selected are purely a matter of chance and the personal bias of the researcher does not influence the selection.

Stratified Random Sampling

Population is divided into a number of groups called strata and each stratum is sampled independently by way of simple random sampling method. This sampling method delivers more accuracy provided it is planned intelligently.

Cluster Sampling

In this sampling method the population from where the sample is drawn out is divided into a number of groups on the basis of some specified characteristics and the resultant groups are designated as clusters. The cluster sampling approach requires selection of a sample of given size from one or more clusters by means of simple random sampling and the resultant sample is called a cluster sample.

Systematic Random Sampling

In this sampling like simple random sampling a list of all the population units is prepared and then serial numbers are given to all. Sampling interval (k) is determined as k= N/n, where N represents total number of population units, and n that of the sample. Thereafter, a number is randomly selected from first sampling interval consisting of units 1 to k. this number

which is denoted as i provide the starting point for selecting a sample of desired size.

Whatever may the method of sampling if the sample is truly representative of the population, then the characteristics of the sample can be considered to be the same as those of the entire population. It is also very important to consider the size of sample during sampling of data. The sample size must be optimum since a small sample is not representative of the population and too large a sample is often difficult to handle. Sample selection is based on given below principles.

1. If the population is large then the sample size should also be large in order to make it more representative and meaningful.
2. Though small samples are easy to handle they are not fully representative and does not lead to valid inferences.
3. Samples should be drawn out randomly from the population as far as possible. The large randomly drawn out samples ensure greater accuracy of results.
4. A homogeneous population could be represented in a small sample whereas a heterogeneous population will require a large sample.

A sampling method means how a sample is actually drawn out from the population. The method of sampling is also important inorder to make it more representative of the population. Sampling is done by following sampling methods.

Sampling and Non-sampling Errors

Errors may take place in the data at various levels during data collection. The smaller the magnitude of errors, the more accurate and reliable are the inferences. It is imperative that the sampling technique is more reliable one. Therefore, the randomness of the sample is very essential as the

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randomly drawn out samples tend to give accurate inferences. However, errors may take place in the experiment and they may be the sampling or non-sampling errors. Sampling errors occur due to the incomplete collection of data. Such errors can be eliminated by taking large randomly drawn out samples. Non-sampling errors are introduced due to technically faulty observations or processing of data. These errors may also occur due to defective processes of data collection. Both the sampling and non-sampling errors must be reduced to a minimum inorder to get as representative a sample of the population as possible.

References

Das, N.G (2009). Statistical Methods. Tata MacGraw Hill Education private Limited, New Delhi.

Jayaraman, J. (1981).“Laboratory Manual of Biochemistry”. Wily Eastern Limited, New Delhi.

Sharma, K.R. (2002). Research Methodology. National Publishing House, Jaipur and New Delhi.

Schefler, W.C. (1969). Statistics for Biological Sciences. Addison-Wesley Publishing Company. Massachusetts.

Whitney, F.L (2004). The Elements of Research. Prentice Hall, Inc, Englewood, New York.

http://www.britannica.com

http://www.lifesciences.napier.ac.uk

http://www.biology.clc.uc.edu

http://www.sciencedirect.com

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