Research Methodology

Proceedings of International Webinar

Held on 27th & 28th November, 2021

BIJNI COLLEGE
बिजनि जौछिन फरायसावि

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Organized by
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গোরাযুঁনি মাবখ' :: बिजनी सोलोंसालिमा

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MESSAGE

It is indeed a matter of great pleasure that, the proceedings of the International Webinar on **Research Methodology** conducted by Research Cell, Bijni College, Bijni in collaboration with IQAC on 27th and 28th November, 2021 is going to be published by the research cell.

I do hope that the publication will provide an opportunity to students, faculty members, researchers of various institutions in designing and adhering to the appropriate methodology throughout for improving the quality of research. The various writings on research methodology will help the researcher to pay attention to an important dimension relating to research, namely research methodology.

I extend my sincere greetings and felicitation to all who have contributed to this publication and enhanced its perfection and congratulate the organizers as well as all stake holders associated with the publication of this collection.

With Best Wishes

Dr. Birhash Giri Basumatary
Principal,
Bijni College, Bijni

Editorial

The quality and progress of every field including business, governess, science, defence and policy making largely depend on the application and outcome of research. Therefore, in higher education, the importance and application of research has become imperative. Research inculcates scientific and systematic approach to knowledge among the learners. It is,in fact, the key to validate one's knowledge and discovery. The progress and growth of a nation largely depend on its application of quality research. Therefore, the research cell of Bijni College, Bijni in collaboration with IQAC organised the two-day international webinar on 27th& 28th Nov., 2021 to promote the culture and practice of research among the students, scholars and faculty. The webinar witnessed submission and presentation of29 no's of research papers on various subthemes of research methodology. After editing, 18 no's of articles have been finalised for publication through this proceeding publication of the webinar. The proceeding of the webinar published herewith aims to compile, foreground and address different theoretical aspects related to research. It aims to assist and guide evolving researchers, students and teachers providing answers to their research methodology related queries.

At last, we express our gratitude to all the stakeholders of the webinar and this proceeding publication for their active participation and cooperation.

Dr. Arup Sarkar **Dr. Sulabh Chandra Das**

CONCEPT NOTE

Research is the buzz word in recent era that thrives on creating and validating new knowledge in an unprecedented manner. In every aspect of living experiences and knowledge creation "Research" has become inevitable and inalienable. Institutions of higher education in India are facing challenges in evolving and coping with both global and local expectations. To keep pace with the philosophical and technological changes all around and nurturing and sustaining quality research, Research Methodology holds an unassailable position. Research methods are means of observing, hypothesizing, searching, arranging, analyzing and providing the evidence to examine ideas that helps in enhancing the existing body of knowledge in a scientific and systematic manner. The salient objective of this international webinar is to discuss and disseminate the evolving methodology for use of UG,PG and Research Scholars in a most credible manner. The programme intends to orient the participants with emerging issues and equip them with qualitative tools of research and also to provide operating knowledge of statistical tools and software.

Sub Themes

- Theoretical framework in Research.
- Designing research (Quantitative and Qualitative).
- Formulation of Hypothesis, Sampling Framework.
- Use of Statistics in Research.
- Data Analysis both Quantitative & Qualitative.
- Writing a Research Paper.
- Foot Notes and References.
- Plagiarism and Ethical Issues in Research.

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Uses of Statistics in Research

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Zamduar College, Saraibil

Abstract

How to explain the data in research effectively? The only way to employ statistical methods, whether in inferential statistics or descriptive statistics, is in research. In general, non-parametric statistics are discussed in relation to qualitative research, whereas parametric statistics are primarily employed in relation to quantitative research.Statistics play a vital role in research activity, for example statistics can be used as in data collection, analysis, interpretation, explanation and presentation. The use of statistics guide researchers in research for proper characterization, summarization, presentation and interpretation of the result in research. Statistical tools and analyses are frequently used to explain research findings, support hypotheses, and give study methodology and conclusions legitimacy. Statistics play a significant part in establishing a country's current situation in terms of per capita income, unemployment, population growth rate, housing, education, and medical facilities, among other things. Statistics now plays an important role in practically every sector, including industry, commerce, trade, physics, chemistry, economics, mathematics, biology, botany, psychology, astronomy, and information technology etc. Statistics is a numerical representation of information. Whenever, we quantify or apply the numbers to data process in order to organize, summarize or better understand the information,the statistical methods are used. These methods can be ranged from very simple calculations like

establishing a distribution mean to extremely complex computations like discovering factors or interaction effects within a large data set. It is critical for researchers, as well as research consumers, to comprehend statistics in order to be informed, assess the authenticity and utility of information, and make proper judgments.This paper is an attempt to enhance the data analysis methods in various researches by using different statistical techniques and also to make understand the role of statistics in various fields.

Keywords:

Research, Statistics, Statistical Techniques, Descriptive and Inferential Statistics

Introduction

Statistics are employed in data collection, analysis, interpretation, and presentation throughout the research process. Researchers utilise statistics to aid in the right description, presentation, summary, and interpretation of their findings.Furthermore, data patterns can be modeled in a way that allows for randomness and uncertainty in the observations, and then utilized to generate inferences about the process or population under study; this is known as inferential statistics. The term "applied statistics" refers to the use of descriptive statistics as well as inferential statistics.The logical premises that support the justification of statistical inference techniques are referred to as "theoretical statistics." "Mathematical statistics" refers to the manipulation of probability distributions necessary for drawing conclusions about methods of estimation as well as various computational statistics and experiment design applications. Knowing statistics gives you the methods and conceptual underpinnings of quantitative thinking you'll need to intelligently extract information from this sea of data.The use of statistics in research will aid researchers in the right characterization, summary, presentation, and interpretation of study findings. Statistics provides a foundation for study into: how to conduct your research, whether utilizing a sample or the entire population, data collecting and observation techniques, and data description (using measure of central tendency).Statistics play a

significant part in establishing a country's current situation in terms of per capita income, unemployment, population growth rate, housing, education, and medical facilities, among other things. Statistics now plays an important role in practically every sector, including industry, commerce, trade, physics, chemistry, economics, mathematics, biology, botany, psychology, astronomy, and information technology, to name a few. Statistical theory and procedures have evolved into specialties that apply to a variety of areas.As a result, statistics can be applied in a variety of ways. Some of them are discussed farther down. Astrostatistics is the branch of statistics that deals with the study of astronomical data. Biostatistics, which includes medical statistics, is a discipline of biology that uses statistical analysis to study biological events and observations. Econometrics is a discipline of economics that studies economic ideas and linkages empirically using statistical methods.Corporate analytics is a rapidly developing business process that uses statistical methods to examine massive data sets in order to gain fresh perspectives on the performance and potential of businesses. Environmental statistics refers to the use of statistical methods to environmental science. There are surveys of the populations of plants and animals as well as information on the weather, climate, air, and water quality. The application of probability theory to the field of mechanics, which studies how objects and particles move when they are subjected to forces, is known as statistical mechanics. Mathematical techniques for coping with large populations can be found in probability theory.Statistical physics is a branch of physics that employs approaches from probability theory to solve physical problems. In the insurance and finance industries, actuarial science is the discipline that uses mathematical and statistical tools to analyze risk. In the study process, various statistical terminologies are used. Sampling of the population Generalization Hypothesis Tests of significance Correlation Analysis of Regression Coefficient of correlation (r) Variables that are dependent and independent Elasticity Deviation from the mean Analysis of Factors t-Test Q-Test The Chi-squared test is a statistical method for determining whether or not U-test Mann–Whitney Wilcoxon matched pairs test (Wilcoxon matched pairs test) Exact

Fisher's test One-way ANOVA & two way ANOVA etc.

Objectives

- To enhance the data analysis skills in various studies by using different statistical techniques and to make understand the role of statistics in research.

TYPES OF STSTISTICS

Statistics is classified into different types on different basis. However some of the major bases for classifying statistics are-

- **Parametric Statistics:** Parametric statistics are used when the calculation is directly dependent on the population. Statistical methods using a normally distributed population. Parametric Tests normally involve data expressed in absolute numbers or values rather than ranks; an example is the Student's t-test, F-Test, Standard scores- Z-test, T & C test, Stanines & ANOVA etc. Parametric tests are restricted to data that: (1) show a normal distribution (2) are independent of one another (3) are on the same continuous scale of measurement. The accuracy of the assumption determines how significant the findings of a parametric test are. The most effective way to determine if the computed sample statistics are significant or reliable is to employ parametric tests.
- **Non-parametric Statistics:** In both parametric and non-parametric statistics, the phrases population and sample are frequently employed. Therefore, when we are clear on the term, it will be easier to understand. The assumptions and conditions may not be met in some circumstances, making it impossible to employ parametric statistical processes. We must use non-parametric statistics in this circumstance. The first meaning of non-parametric covers techniques that do not rely on data belonging to any particular distribution. Non-Parametric Test is the statistics is based on the ranks of observations and do not depend on any distribution of the population. In non-parametric statistics, the techniques do not assume that the structure of a model is fixed. Non-parametric statistics deals with small sample

sizes, are assumption free meaning these are not bound by any assumptions are user friendly compared with parametric statistics and economical in time. Examples of Non parametric statistics are- Chi-square, KS Test, Sign test, sign rank test etc. The test Non-parametric are used on data that: (1) show an other-than normal distribution (2) are dependent or conditional on one another (3) in general, do not have a continuous scale of measurement

- **Descriptive Statistics:** The main function of descriptive statistics is description of obtain data. It deals with classification, tabulation, graphical representation of data. Descriptive statistics is useful in generalization of data of a group and help in the interpretation and summarization of the data. Measurement of Central Tendency, Measurement of Variability and Graphical Representation are included to the descriptive statistics.
- **Inferential Statistics:** Inferential statistics or statistical inference is the branch of statistics which deals with the deriving scientific conclusion of the generalization of data.Inferential Statistics is used to determine the probability of properties of the population on the basis of the properties of the sample, by employing probability theory. The major inferential statistics are based on the statistical models such as Analysis of Variance, chi-square test, student's t distribution, regression analysis, etc.

STAGES OF STATISTICS

- Collection of data
- Organization
- Analysis
- Interpretation

TYPES OF GRAPHICAL REPRESENTTION

Used in Qualitative Research

Most commonly used types of graphical representation are-

- Frequency Polygon
- Cumulative Frequency Graph

- Cumulative Percentage Curve or Ogive.
- Histogram
- Bar Diagram
- Pie Diagram

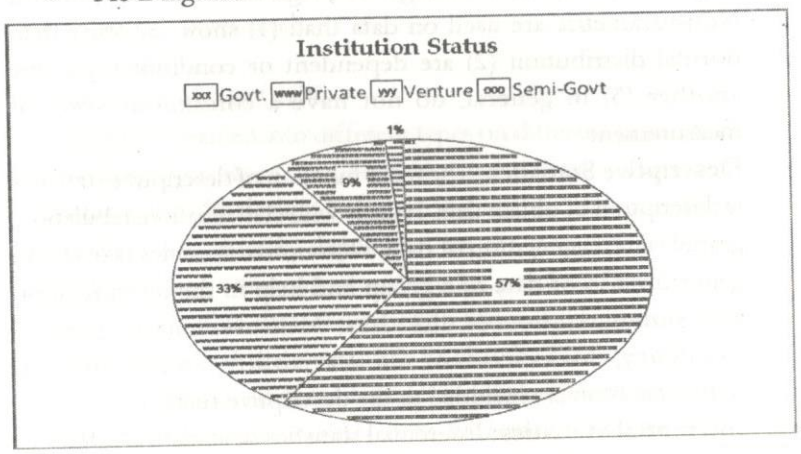

Fig. No. 01: Pie Diagram
Percentage of Educational Status

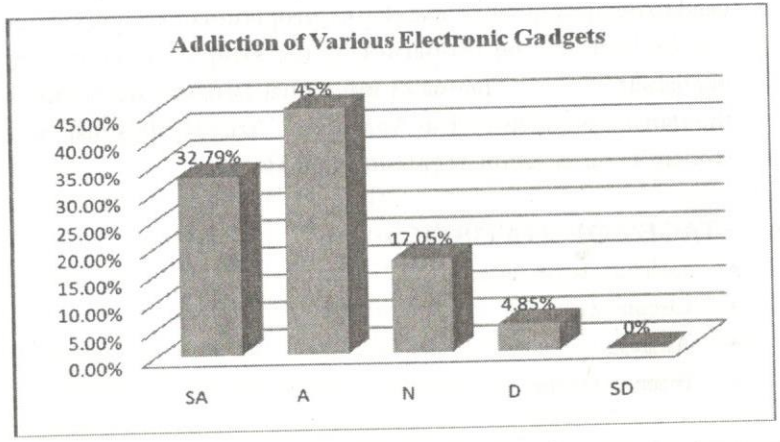

Fig. No.02: Bar Diagram
Addiction of various Electronic Gadgets by the students in percentage

Use of statistics in Quantitative Research

- When we have structured questionnaire with the **rating scale**

or rating order, researcher can decode the information in numbers. (Eg- Yes = 1 and No= 0, or SA=5, A=4, N=3, D=2, SD=1 etc.)

- The **t-test** is a statistical technique, to compare the mean of two different variables. It helps to test the Null Hypothesis and to measure the significant different between two variable. Developed by William Sealy Gossett

Use of statistics in Quantitative Research

- **Example-**The researcher establishes a null hypothesis that, there is no difference between pre-intervention and post-intervention scores to list whether there is a statistically significant difference. (H0)

- **Using student t-test method**

Students	Pre-Test Score (X)	Post-Test Score (Y)
1	9	12
2	8	10
3	15	15
4	12	14
5	8	14
6	4	11
7	6	10
8	3	8
9	3	8
10	2	8
N=10		

- **Calculation of t-test manually**

Students	Pre-Test X	Post-Test Y	D (Y-X)	(D)2
1	9	12	3	9
2	8	10	2	4
3	15	15	0	0
4	12	14	2	4
5	8	14	6	36
6	4	11	7	49
7	6	10	4	16
8	3	8	5	25
9	3	8	5	25
10	2	8	6	36
N=10			∑D= 40	∑D2= 204

$$t = \frac{\frac{\sum d}{N}}{\sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{N}}{N(N-1)}}}$$

$$= \frac{\frac{40}{10}}{\sqrt{\frac{204 - 160}{10(10-1)}}}$$

$$= \frac{4}{\sqrt{\frac{44}{90}}}$$

$$= \frac{4}{\sqrt{0.488}}$$

$$= \frac{4}{0.698}$$

$$= 5.72$$

CALCULATION WITH SPSS SOFTWARE

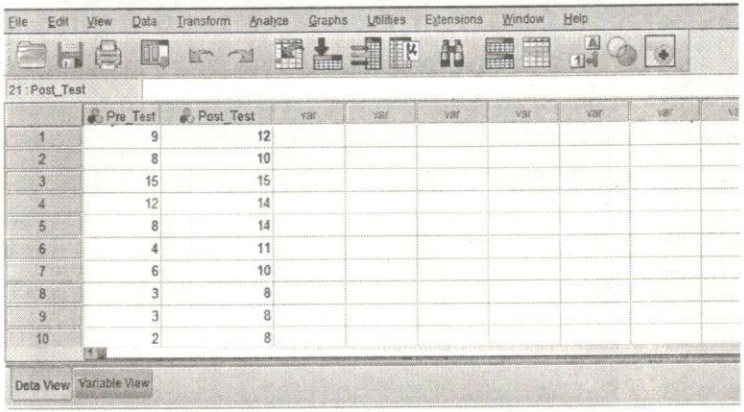

Fig. No.03
Step-I : Insert Variables and Data

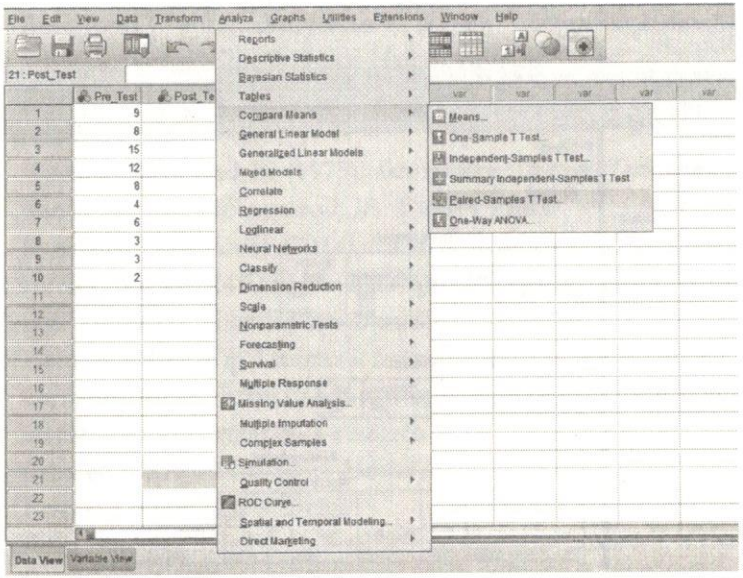

Fig. No.04
Step-II : Analysis Process

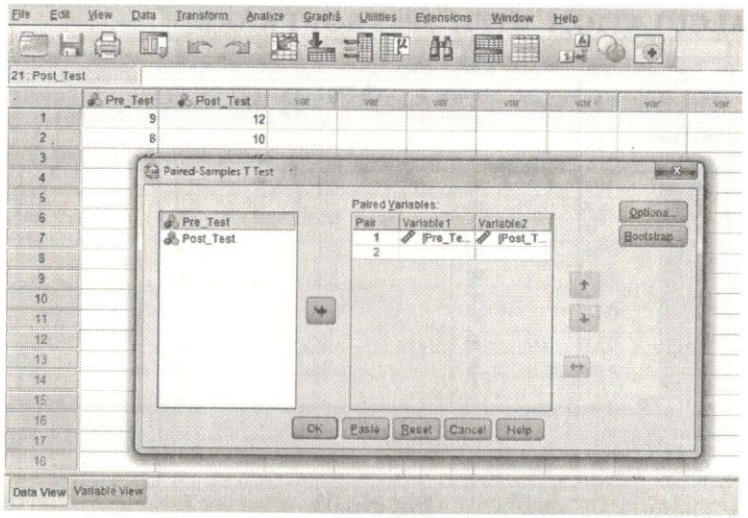

Fig. No.05

Step-III : Put the values in right place

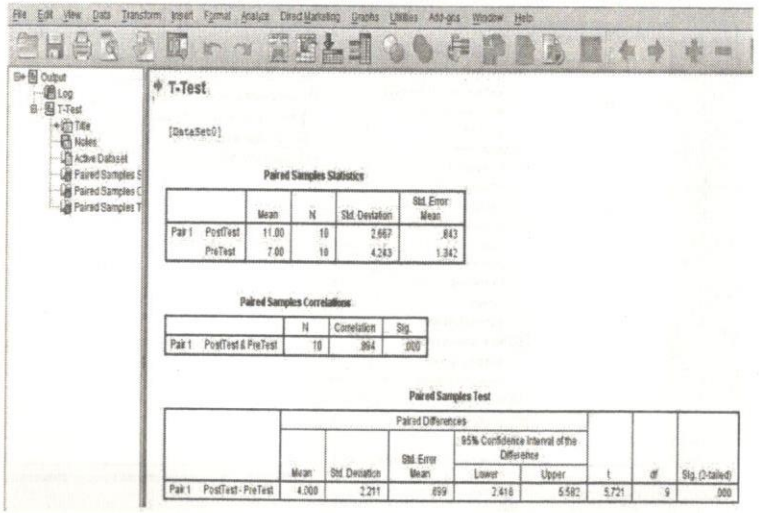

Fig. No.06

Step-IV : Result or Output

CONCLUSION

We can employ a variety of statistics in the course of our investigation. However, we are unable to employ statistics in study due to a lack of statistical knowledge. Data visualization is a procedure used in statistics. One table or figure can convey a lot of information. Knowledge of big data analysis applications, including R, SPSS, Arc, and Gis, is very crucial now.The data analysis can be used as the earning profession. There are many Companies, Research Institutes and Organizations wanting big data analysis and they are ready to pay big amount, but due to information gap and skilled personalities we are lacking behind from this opportunities.Statistics, also known as the "Science of Facts," allows us to derive conclusions from a set of data. It may also assist people from all industries in answering research or commercial inquiries, as well as predict results.

REFERENCES

- Basumatary, D. & Basumatary, L. (2020), *Advanced statistics and its applications in education*, Eastern Book House, Guwahati-01.
- Best, John W. and Kahn, James V., (1986). *"Research in Education,"* 5th Ed., New Delhi: Prentice-Hall of India Pvt. Ltd.
- Gopal, M. H. (1965). *Research Reporting in Social Sciences,* Dharwar: Karnatak University.
- Gorden, Raymond L. (1975). *Interviewing: Strategy, Techniques and Tactics,* rev. ed., Homewood, Ill.: Dorsey Press.
- Journalists Resources (2014), 'Statistical terms used in research studies', Viewed 24 October 2021, http://journalistsresource.org/skills/research/statistics-for-journalists#
- Kent, J.(2013). *Why Statistics is Important to a Research?*, Viewed 24 October 2021, http://education.blurtit.com/335945/why-statistics-is-important-to-a-research
- Saha K. (2012). *Statistics in Education and Psychology*; Asian Books Private Limited, New Delhi.
- Sahu Binod K. (2008). *Statistics in Psychology and Education*, Kalyani Publishers; Ludhiana.
- Sharma, B. et al., (1983). *Research Methods in Social Sciences,* New Delhi: Sterling Publishers Pvt. Ltd.

Structure and Ethics of a Research Paper

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Abstract

A Research Paper is an academic writing of the original research work done by a Researcher. It is an organized report as per its structure and ethics. Research Paper must undergo a process of plagiarism test and peer review before publication in an academic journal. After the acceptance of the Research Paper, Researcher has to do a copy right agreement with the publisher. In this paper, I have discussed in details about the Structure and Ethics of the Research Paper.

Key wards: Research paper, Researcher, Plagiarism, Peer Review, Academic Journal, Copy Right, Ethics.

1. Introduction

Research is "creative and systematic work undertaken to increase the stock of knowledge". It involves the collection, organization and analysis of information to increase understanding of a topic or issue [1]. According to Kothari (2018), Research is a pursuit of trust with the help of study, observation, comparison and experiment, the search for knowledge through the objective and systematic method of finding solutions to a problem [2]. A Researcher highlights his research works through the Research Paper and therefore it has an important role in any research activities. Mainly, Research Papers are published in different academic journals and Proceedings and presented in different academic seminars, webinar and conferences [3,4]. To be an acceptable Research Paper, it must follow some

standard Structure and Ethics. Research may be different types but the Structure and Ethics of the Research Paper more or less same. This paper is organized as follows. In section 2, I have discussed about the Structure of a Research Paper. In section 3, I have explored regarding the Ethics of a Research Paper. Finally in the section 3, conclusions are given.

2. Structure of a Research Paper

The standard of a Research Paper depends upon its Structure. Therefore, at the time of writing a Research Paper, Researchers should follow its Structure guidelines. The main Structure of a Research Paper is as follows [5, 6, 7]

a) Title page,
b) Abstract,
c) Introduction,
d) Material and Methods,
e) Results and Discussion,
f) Conclusion,
g) Acknowledgement (if any),
h) References,
i) Appendix

a) Title page:

Title page is the initial page of a Research Paper. It should include

i) Paper's Title,
ii) Author's Name,
iii) Author's affiliation,
iv) Author's Email addresses and contact numbers,
v) Corresponding author's Email address,
vi) Date of completion

b) Abstract:

Abstract provides a general idea of the research. It should contain

i) A single paragraph,
ii) 150 to 250 words,
iii) The problem to be investigated,
iv) The purpose of the study,

v) Methods used,
vi) Major outcomes,
vii) Interpretations and implications of the results,
viii) 4 to8 Keywords.

c) Introduction

The Introduction section is one of the most important sections of a Research Paper. This section should start with a brief outline of the topic and then explain the nature of the problem and why it is crucial to resolve this issue. This section should contain a literature review that provides relevant background information about the topic. The last part of the introduction should contain about the own work and mention how the rest of the paper is organized.

d) Material and Methods:

This section should include the detailed information about what materials, sample, tools, techniques, procedure, **designs,** calculations, statistical tests, measurements are **used to carry out the research works (analytical, statistical and experimental). Also source of chemicals and drugs, animal used, ethical committee permission should be mentioned.**

e) Results and Discussion:

Results and Discussion section of the Research Paper should be the ultimate part of the Research Paper. The results section should narrate the findings without trying to interpret or evaluate and provide a direction to the discussion section of the Research Paper. The discussion section should interpret the results and provides the significance of the findings. Also it should include the comparative study between the current results and the previously published results of the similar works mentioned in the literature.

f) Conclusion:

Conclusion is the vital part of a Research Paper. It should include the outcomes of the research work, important findings, limitations of the study, Researcher's views and suggestions for further research.

g) Acknowledgements (if any):

It should have the brief information regarding any research grant, support or assistance of colleagues or institutions that made the research possible.

h) References:

The references section is a very important component of the Research Paper. It should be arranged at the end of the Research Paper in order of their appearance in the text. Each reference should follow specific guidelines regarding author names, dates, article titles, journal titles, journal volume numbers, issue numbers, page numbers, book publishers, publisher locations, websites, and so on.

i) Appendix:

An appendix contains supplementary materials that is not an essential part of the text itself but which may be helpful in providing a more comprehensive understanding of the Research Paper. It may include some of the following, all of which should be referred to or summarized in the text of paper

- Supporting evidence or raw data,
- Contributory facts or specialized data,
- Sample calculations,
- Technical figures, graphs, tables, statistics,
- Detailed description of research instruments,
- Maps, charts, photographs, drawings,
- Letters, emails, and other copies of correspondence,
- Questionnaire/survey instruments, with the results appearing in the text,
- Complete transcripts of interviews,
- Complete field notes from observations
- Specification or data sheet,

3. Ethics of a Research Paper

Research Ethics provides guidelines for the responsible conduct of research. Additionally, it educates and monitors the Researchers for conducting research with a high ethical standard. The following is a general summary of some ethical principles [8, 9]

Honesty:

Honestly or sincerely report data, results, methods and procedures and publication position. Do not formulate fake, or misrepresent

data.

Objectivity:

Endeavor to keep away from bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, expert testimony and other aspects of the research.

Integrity:

Maintain promises and agreements; act with sincerity; endeavor for uniformity of thought and action.

Carefulness:

Keep away from careless errors and negligence; carefully and critically examine own works and the work of the peers. Maintain excellent records of the entire research activities.

Openness:

Frankly distribute data, results, ideas, tools, resources. Be open to analysis new ideas.

Respect for Intellectual Property:

Respect patents and other forms of intellectual property. Do copyright agreement with the publishers before paper publication. Plagiarism is a crime. Ensure plagiarism free paper by plagiarism test. In any papers, never include any unpublished data, ideas, methods or results without consent. Give credit wherever credit is due.

Confidentiality:

Protect all kinds of confidential communications, such as paper submission for publication, personnel records, business or military secrets and patient records.

Responsible Publication:

Paper publications are for the purpose of advance research and study. Publish own works paper and keep away from the duplicate publication.

Responsible Mentoring:

Assist to educate mentors and recommend students. Encourage their interests and allow them to make their individual decisions.

Respect for Colleagues:

Respect the colleagues and treat them fairly.

Social Responsibility:

Attempt to encourage social good and prevent social harms through the research.

Non-Discrimination:

Avoid the discrimination against the colleagues or students on the basis of sex, race, traditions or other factors that are not related to their scientific competence and integrity.

Competence:

Develop self professional competence and skill through the lifelong education and learning; capture steps to promote competence in science and technology.

Legality:

Identify and obey all relevant laws along with institutional and governmental policies.

Animal Care:

Show proper respect as well as care for the animals when using them in research activities. Do not conduct any unnecessary animal experiments.

Human Subjects Protection:

When conducting research on human subjects, minimize harms, maximize benefits and respect human dignity, privacy and autonomy.

4. Conclusion

The standard of a Research Paper depends upon its Structure. Also, Research Ethics provides guidelines for the responsible conduct of research. Therefore, the basis of an outstanding Research Paper is its good quality Structure and Ethics.

References

1. https://en.wikipedia.org/wiki/Research
2. *Kothari*, C.R. 2018. *Research Methodology: Methods and techniques* (4th Edition) New Delhi: New Age International (P) Limited
3. https://www.scribbr.com/category/research-paper/
4. https://thebestschools.org/resources/how-to-write-research-paper/
5. https://www.ref-n-write.com/trial/research-paper-structure-main-sections-and-parts-of-a-research-paper/

6. https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1442-2042.2009.02278.x
7. https://www.aresearchguide.com/4format.html
8. https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm
9. https://www.publichealthnotes.com/research-ethics-definition-principles-and-advantages/

Qualitative Research in Social Science

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Abstract

Quality research is one of the significant methodological paradigms used in social science research. Usually researchers used this approach to explain deep sense of imagination regarding certain social situation. It is expiratory regarding interpretation of information gather by researcher especially from primary sources. To understand socio-economic life pattern groups in define set up quality research use in narrative and ethnographic study. The approach by and large avoids extensive used of number and figures. Where the issues of sentiments and emotions are attached in a great way, maximum researchers use qualitative approach to gather information as well as interpret the research findings. Considering the significance of qualitative research, the paper therefore aims to understand the pros and cons of qualitative research in problems of social science. The present study uses specially secondary sources of information to realise the objectives of the study. However, the researchers incorporate an example of marriage system of Mishing people in Assam.

Key Words : Qualitative Research, Social Science

Introduction

Qualitative research is one of the significant methodological

paradigms used in social science research. It involves deep sense of imagination. It is explanatory and uses generally narratives and ethnographic study. Qualitative social science research is fundamentally embedded in grounded theory concerned with how the social world is interpreted, realized, understood and experienced, or produced. Qualitative investigation seeks answers to their questions in the realistic world. They congregate what they see, hear and read from the people and places and from events and activities and their main purpose are to learn about some aspects of the social world and to generate new understanding that can be used by that social world. Qualitative researches in Social Sciences interpret cultures and people's life-ways rather than seeking fundamental explanations for cultural practices. American anthropologist Clifford Geertz was a foremost figure of the interpretive or the symbolic anthropology school. According to the interpretive approach in anthropology, meaning is constituted out of interaction between individuals; the symbols and meanings are public in their significance and are not confined to single individual brains or the private sphere. It is the public or social aspects of meaning that is the focus of analysis for the proponents and followers of this approach. Geertz makes an influential case for anthropology as an interpretive science by clarifying that clarification of details in local cultural context rather than aiming at grand comparison is "interpretive anthropology" and also the way for anthropological work. For Geertz (1973), the concept of culture is fundamentally a semiotic one and he makes it clear in one of his most frequently quoted statements.

Objective of the study

The paper aims to understand the pros and cons of qualitative research in problems of social science.

Methodology of the study

The present study uses specially secondary sources of information to realise the objectives of the study. However, the researchers incorporate a case study of the marriage system of *Mishing* people in Assam. They gathered information from the village of Khabulu under Ranganadi panchyat of Lakhimpur district. The methods used in data

collection are interview scheduled as well as observation. Researchers narrate the findings.

Basics of the Qualitative Research

Qualitative research reveals some of the basic characters. Without knowing them properly we cannot actually interpret the pros and cons of qualitative research. These are:

- Data collected from natural settings.
- Primary data collection appears as significant. It uses non-statistical methods to gain understanding about a social situation.
- Researcher plays a vital role in data collection and interpretation.
- Generally used methods like observation, interview, focus group discussion, ethnography etc.
- Less use of numbers and figures

Significance of Qualitative Research in Social Science

After analyzing the basics of qualitative research, the researchers try to locate the positive aspects associated with qualitative research in the fields of social science research. Some vital points of significance are enlisted below.

- Useful for explaining emotional situations, situations of varied social set up.
- It is helpful in gaining deep understanding of a specific organization or event.
- It lets the meaning of a situation emerged from the participation.
- It is frequently used in academic research, but it is also essential for the voluntary and non-profit sector as well as more commercial applications.
- Researcher explains the situation, often use narratives.
- Empathy of the researcher can bring accurate results.
- Data is usually collected from small, specific and non-random samples.

- Anthropological studies, ethnographic studies, critical social research, ethical inquiry, field research, ground theory, naturalistic studies, participant observer research, phenomenology etc. are certain methods used in qualitative research to gather information and conclude the findings.
- It helps to understand the motivations and perspectives of clients or customers.
- It can be used in pilot studies and can generate original insights, concepts and ideas.
- It can be used to understand the cognitive and emotional or effective landscape of society, institutions or rural or urban contexts.
- It can provide details about human behaviour, emotion, and personality characteristics.
- It is useful for finding out more about the complex situations.

Problems in Qualitative Research:

While conducting qualitative research, researchers often faced hurdles specially in time of data collection.

- It is more time consuming in terms of data collection.
- In qualitative research, it is more difficult to interpret data.
- More difficult to quantify the data.
- Regarding case study, only a case study with limited applicability to other situations.
- It is difficult to control the biasness of the researcher.

A Case study of 'Mishing Marriage System

Marriage is an important universal and social institution. It forms and functions are changes in their traditional culture. In Mishing society exogamy, endogamy, polygamy and cross cousin marriages are seen. There are five types of marriage systems found among them.

1. Arranged marriage
2. Elopement marriage
3. Obtaining girl by service
4. Marriage by force
5. Divorce and remarriage

Arranged marriage

Arranged marriage is done by both the family of girl and boy with mutual understanding. After choice of the bride, the parents or guardians of the groom give the information to visit the bride's family. Accordingly, parents of the bride arrange necessary items for the welcome of the people of groom side. According to the Mishing folk belief the same titles of bride-groom are not allowed to marry. These types of relationship mean the kinship from the ancestral times. In formal marriage system, generally the boy's family approach to the girls' family for purpose of marriage. If the boy has choice to the girl for get married after few days the boy side give information to the girls' family. If the bride family is agreed the offering of the groom side then accordingly arrange a specific date, day and time to discuss for the further process as well as date of marriage. After discussion with family members the girl side inform to the bride side to come their home to finalised date of marriage. On the consensus of all members present both the family fixed the marriage date. As per their tradition the groom usually come to the bride's house in an interval of one week or a month. He performs a few works in the bride house. But now this system is less practised among the Mishing society due to development of education .At the time of marriage the well dressed groom comes to the bride's house. The groom with two of his friends of similar age and two young girls accompany him on the marriage day. Following the groom two persons carry two containers of dry fish. Besides according to earlier decision the groom's side carry certain numbers of pigs, pot of black rice and betel –nut. In this system there is no rule of offering money to the bride's side. When the groom arrives in house of the bride then aged women from bride's part warmly welcome to the groom. Usually in front of the bride's home they arrange pandel for the groom party to take rest. Accordingly with their ritual the actual marriage system is performed. On that day all the young boys and girls, aged persons, kids of the village are assembled. The assembled people also take food with fish,

meat, rice-beer and rice. After the feast has over the bride- groom take 'Sewa'(blessings) from priests, parents of the bride and from the assembled people. After taking blessings, the groom has taken the bride to his home.

Elopement marriage

This marriage system is common and popular form of marriage of Mishing society. If a boy and a girl's parents are not agree with their marriage due to some unusual condition then both loved boy and girls run away to distant place. After some days, the boy's parents inform the girl's parents and girl's father comes to the boy's house with his few blood relatives. A meeting is held in the boy's house to take decision for bride price and other matters. If the girl family is agreed offering of the boy family then decide to bring bride to the groom house. The Mishing society uses the similar system of welcoming of the new bride as that of the general system of marriage. After completion of the initial ritual the new couple is asked to touch the rice or the paddy arranged in the door steps. After that they take blessing from the groom parents. At night of the special day when the new bride-groom enters into the groom's house usually Mishing organised a feast. . After completion of one or two months of taking away of the girl, the people from the groom's part visit the house of bride to offer the value of the girl known as *'Orai-alig'*. This system is usually performed at night. The value of *alig* is usually given in the form of money or domestic animals. After offering money and betel nut, the groom's part request the bride's part to take *'alig'*. The reason behind is that without informing of the girls family while taken away the girl. Therefore as a moral responsibility the groom's part apologies before bride's family and ask them to take *'alig'*(demand) as a value of the bride. It is a prevalent custom of Mishing society. There is no specific value has been decided for *'alig'*(demand).

Obtaining girl by service

In this marriage system the bridegroom willing to marry a girl and serves his future father- in-law house for four to five years. If during the period of service the bride's father feels satisfied with the

bridegroom, then he offers his daughter to marry with groom. But, now a day this marriage system has almost disappeared in the Mishing society.

Marriage by force

In this system the boy by force marry the girl due to some economic conditions or some other reasons. But this type of marriage less practised among the Mishings society. Actually, if the girl unwilling to marry with the boy then the boy use in such unfair mean. It is a simple and less expensive marriage system. The boy family decide to arrange a programme to offering feast for the village people. Only the most intimate and close relatives are invited on date party. This form of marriage is generally practised by following a compromise between the bride and the groom's parties in case of forceful abduction of an unwilling bride by the groom.

Divorce and remarriage

Divorce is allowed in Mishing villages. As per willingness, husband can leave his wife and vice-versa. In some cases, the wife can leave or divorce her husband due to some unacceptable reasons such as suffering from insanity, drunkard, torture, inhuman behavior, economic condition and marriages with more than two or three wives, etc. Besides, the husband also can leave his wife for the same causes. A widow or widower can remarry. If a woman becomes widow in her early life then she can remarry with unmarried youth, married man, widower and also husband's younger brother not elder brother as per their custom. Actually the polygamy marriage system is also permitted in the Mishing society. But due to impact of education in Mishing people now less numbers have practised in such type of marriage.

Conclusion

From the above discussion we find that qualitative research is one of the vital methods of social science research. Expansion of different tools and electronic devices made tremendous changes in methods of data collection, field study, analysis and report writing. Interpretive

tradition in qualitative research is undergoing the alteration concerned with interpretation, understanding and experiences of social world. Besides, qualitative researches in Social Sciences interpret cultures and people's life-ways rather than seeking fundamental explanations for cultural practices. In case of 'Mishing marriage system we have find different system of marriage. It's nature and functions are changes along with their traditional culture. In Mishing society exogamy, endogamy, polygamy and cross cousin marriages are seen. Besides, we have seen flexibility regarding widow remarriages and social acceptance in the Mishing society too.

References

1. Denzin, N. K., & Lincoln, Y. S. (Eds.). (2005). Handbook of qualitative research. (3rd ed.) . Thousand Oaks, CA: Sage.
2. Geertz, C. (1973). Thick Description: Toward an Interpretive Theory of Culture. The Interpretation of Cultures. New York: Basic Books.
3. Glaser, B. G., & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Hawthorne, NY: Aldine.
4. Pegu, I. (2003): "Mishing samaj aru Sanskriti", Assam Institute of Research for Tribals and Scheduled Castes, Guwahati-781002.
5. Kuli, J.J. (ed.2012), "The Misings: Their History and Culture", Koustav Prakashan, Dibrugarh-01.
6. Mipun, J. (2012), "The Mishings (Miris) of Assam: Development of a new life styles" Gyan publishing house, New Delhi-110002.
7. Baruah, P.C.(2010) "Cultural tradition and customary Laws of the Mishings of Assam" Spectrum Publication, Guwahati-781001, Assam.

Plagiarism Detection Tools : A study

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Abstract:

In the era of technology, many tools and techniques have been developed to detect plagiarism. Still, it is very difficult to detect plagiarism. This paper depicts some of the common plagiarism detecting tools and methods which are used for detecting the plagiarism. This detecting tool is a kind of software which is used for detecting plagiarism done in academic institutions while writing research papers, journal articles, etc.

Keywords: Plagiarism, Technology, Software, Tools, Detection

1. Introduction:

Plagiarism is the presentation of someone else's work or ideas as their own, with or without the consent of the original author, by incorporating it into their own work without full acknowledgement. All the published and unpublished materials, whether in manuscript, printed or in electronic form, is covered under this definition.Detecting and controlling the plagiarism in higher educational institutions has become a challenge.In the Universities and Colleges, students and research scholars are given different projects and tasks to be done, where some of them try to copy the assigned projects and tasks. This is a menace, which is difficult to control because of the easily available resources found in the internet.

2. Importance of plagiarism detection tools:

In academic institution like Universities and Colleges and institutions of importance, plagiarism detection and prevention has become a challenge. Students and research scholars are copying or cheating their assigned tasks and projects because of the readily available resources found online in the internet. The search engines help in searching the available resources from the internet and can be used without citing the owner of the particular document. This has necessitated the use of plagiarism detection tools in academic institutions to stop and to control the cheating and copying of documents.Various types of plagiarism detection tools are available which are used for the detection of plagiarism. Plagiarism can be detected by using plagiarism detection software's available on the market and also in the internet, which are available online. There are also anti-plagiarism detection tools available on the internetwhich makes difficult to detectby the plagiarism tools. Thus, plagiarism detection tools also have some limitations. Though it can't detect 100 % of the plagiarism, but still, it can help in detecting the plagiarism up to some reasonable extent. Plagiarism detection software detecting a particular author whether he has legally or illegally copied the documents and if he has the permission from the owner to use the particular document are covered under copyright acts. Plagiarism detection tools plays a pivotal role in the publication of journals and research articles by ensuring that the documents have not been plagiarised and also to save the copyrights from the violation for the publishers.

3. Plagiarism detection tools:

Several plagiarism detection tools have been developed to meet the need of detecting the plagiarism. This plagiarism detection software's use different methods and techniques to detect plagiarism. The techniques include text matching with indexed sources, style analysis of content and tests requiring students and researches to fill in blanks in their own paper.It has both advantages and disadvantages but all are similar in that they attempt to detect

plagiarism after it has been committed and rely on the threat of detection software's.Some of the common plagiarism detection tools are discussed below in brief.

3.1 Ouriginal:

The Ministry of education, Govt. of India has initiated a programme "Shodhshuddhi" which provides access to plagiarism detection software to all Universities and Institutions in India since September 1, 2019, 1000+ institutions are included which are Central Universities, State Universities, deemed to be Universities, centrally funded technical institutions and Inter University Centre (IUCs) of UGC. Under this initiative, Ouriginal (formerly Urkund) a web based plagiarism detection tool is provided to all users of Universities and Institutions in the country. It is a web based service which carry out detection of plagiarism. It is an integrated and automated solution for plagiarism detection. It is a service which uses standard email system for document submission and for viewing results. It gives priority to educational sources of documents while searching.

3.2 Turnitin:

It is a product from iparadigms. It is actually a web based service where detection is done online. Detection and processing is done remotely. The user uploads the suspected document to the system database. The system then creates a complete fingerprint of the document and stores it in the server for availability in the web.

3.3 GPSP- Glatt plagiarism screening program:

This is a system which uses different approaches to detect plagiarism. It finds and uses the writing style of the authors to detect the plagiarism. This service works locally and it asks the author to go through a test by filling the blank spaces. The number of correctly filled spaces and time taken to complete the test are used to make a hypothesis about the plagiarism. This system is basically developed for the teachers.

3.4 Plagiarism detect:

This is a tool where user needs to register by providing correct information. After completing the registration, users are allowed

to input text in a given text box or as a file by uploading for analysis. It is a free service which at the end sends evaluation report to the users mail account with a list of links from where information is copied.It specifies the amount of plagiarisms in the percentage wise which is detected. To use this software, user needs to download and install the software.

3.5 Plagiarisma:

It is a plagiarism detecting tool which is free of cost. This tool supports 190+ languages and it does not store any scanned content. The input file can be provided in three ways (1) Copy paste (2) Check by entering URL (3) Uploading file. This tool lacks some of the advanced features, so it cannot be relied for heavy detecting works.

3.6 Plagiarism checker:

It is freely available online in the internet which uses Google or Yahoo service to check whether documents submitted by the students are copied from the source available in the internet or not. It encloses each phrase in quotation marks and inserts an OR between each phrase during checking.

3.7 Plag Tracker:

This plagiarism checker is extensively used for students, researchers, teachers, publishers and website owners. It has a large database of academic publications in millions which can provide detailed report of the scanned work. It requires a monthly subscription charge if someone wants to check assignments in large numbers.

3.8 Plagiarism Scanner:

It is an effective plagiarism detection tool for students, publisher and bloggers. It is an online detection tool and very user friendly. It can conduct detection of plagiarism of a submitted document within a few minutes. It is a tool which verifies all the internet resources, such as websites, digital databases, etc. after the detection of plagiarism, it generates a report indicating the overall originality rating and the percentage of the plagiarized documents in the submitted texts. It also helps in sharing the plagiarism reports by giving them the link generated by the tool.

3.9 Plagiarism Detection.Org:

It is an online service which can provide very authentic level of accuracy while detecting the plagiarised works. It is specially designed to help the students and teachers to maintain and to ensure or prevent and detect plagiarism while performing academic tasks.

3.10 Plug Aware:

It is an online detection tool which is used for detecting textual plagiarism. The function of the tool is that, it can search, find, analyse and trace the plagiarism in the specified topic similar to the topics. It is actually a search engine, which is strong in detecting typical contents of given texts.

3.11 Chech For Plagiarism.net:

It is a detection tool which was developed by a team of professional academicians. In the course of time, it became one of the best suited online plagiarism detection tool used for the prevention of online plagiarism. To increase its accuracy in checking, it has used the methods of document fingerprint and document source analysis to protect document against plagiarism.

4. Conclusion:

There are different types of tools which are used for detecting plagiarism. This tools used for detecting plagiarism in academic institutions has some advantages and also has some limitations. It can't prove that a particular document is 100%plagiarised. Thus we can conclude that, though the tools help in detecting plagiarism, but there is no plagiarism tool till now which has been described as the best one.

References:

1. Alzahrani, S. Salim, N. Abraham, A., "Understanding Plagiarism Linguistic Patterns", Textual Features and Detection Methods, 2011.
2. Asim M. El Tahir Ali, Hussam M. Dahwa Abdulla, and V_aclavSn_a_sel, "Overview and Comparison of Plagiarism

Detection Tools", V. Sn_a_sel, J. Pokorn_y, K. Richta (Eds.): Dateso , pp. 161-172, 2011.

3. Bao Jun-Peng, Shen Jun-Yi, Liu Xiao-Dong, Song Qin-Bao, A Survey on Natural Language Text Copy Detection, Journal of Software, 2003, vol.14, No.10, pp. 1753- 1760.
4. Hage, J. Rademaker, P. Vugt, N. A comparison of plagiarism detection tools, Technical Report UU-CS-2010-015,June 2010, Department of Information and Computing Sciences Utrecht University, Utrecht, The Netherlands.
5. Hoad, T. C., Zobel, J. Methods for Identifying Versioned and Plagiarized Documents. JASIST 54(3): 203-215 (2003)
6. James Douglas Beasley, "The Impact of Technology on Plagiarism Prevention and Detection: Research Process Automation, a New Approach for Prevention", Plagiarism: Prevention, Practice and Policies 2004 Conference March 2004.
7. Jain, K. Murty, M. N., Flynn, P. J. Data clustering: a review. ACM Computing Surveys, 31(3):264–323, 1999.
8. Lancaster, T., F. Culwin. (2006). Classifications of Plagiarism Detection Engines", ITALICS Vol. 4, Issue (2).
9. Xiaomeng Zhang Reference Librarian, "How to Detect Plagiarism", REFERENCE UNIT January 20, 2011.
10. Zechner, M., Muhr, M., Kern, R., Michael, G., "External and intrinsic plagiarism detection using vector space models", In Proceedings of the SEPLN'09Workshop on Uncovering Plagiarism, Authorship and Social Software Misuse, 2009.

Intellectual Property Rights (IPR) and their Importance in Indian Context

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Abstract

A study on the Intellectual property (IP) and Intellectual property right (IPR) with special reference to Patent in Indian context were carried out using standard literature. IP refers to creations of mind, inventions in artistic, literary, Scientific, Industrial field, design of an article, mark used in trade, poems, paintings, photographs, symbol etc. IPs is a property of the owner that can be sold and licensed. The IPs can seek rights for legal protection which are provided by IPR. The different forms of IP protection are Patent, Geographical Indication (GI), Copyright, Trademark, Design etc. IPR are intangible in nature and gives exclusive rights to inventor or creator for their valuable invention or creation. They usually give the creator an exclusive right over the use of his/ her creations for a certain period of time. It allows the creator(s)/ owner(s) to have the benefits from their work when these are exploited commercially. IPR are granted to an inventor or creator designer in lieu of the discloser of his/ her knowledge. In present scenario of globalization, IPR is the focal point in global trade practices and livelihood across the world. These rights enhance the innovative environment by giving recognition and economic benefit to creator or inventor whereas the lack of IPR awareness and its ineffective implementation may hamper the economic, technical and social developments of nation. In the present scenario it is essential for all the scientist and researchers to acquire the

of Patents Designs and Trademarks govern the patent registration process. After getting the rights, the owner can explore these rights by industrial production or can sell, distribute or licensing the rights as per his will. In India the governing law for patent protection is the Patents Act, 1970. The term of patent is 20 years from the date of filing the patent application [12].

Design:

An industrial design-or simply a design- is the ornamental or aesthetic aspect of an article produced by industry or handicraft. Any product or article is not only distinguished by its technical characteristics but also by its visual appearance or design. An industrial design relates to the aesthetic or outward appearance of the product. It is what makes a product attractive or appealing to customs. It belongs only to the external features of an article and not to its technical and functional characteristics. The owner of a registered design has an exclusive right over the use of the design [9].

The term of industrial design rights vary from country to country from 10 to 25 years. In India as per Design Act, 2000 duration of protection of industrial design is for 10 years. This duration can be extended further for 5 years. The patent offices at Chennai, Mumbai, New Delhi and Kolkata also deal with industrial design. The patent office, Kolkata maintain the register of design as statutory requirement of all concerned information of filed industrial design [10].

Trade Mark:

A trademark or brand-name is a distinctive sign which identifies certain goods or service as those produced or provided by a specific person or enterprise. Like how a name identifies an individual the trade mark provides the identity and origin of a product. As per the Trade Marks Act, 1999 a mark is a device, brand, heading, label, ticket, name, signature, words ,letter, numerals, shape of goods, packaging or combination of colors or any combination thereof. The initial term of the trade mark is 10 years that can be extended every 10 years thereafter for an indefinite period by paying the prescribed fee [13].

There are two primary types of marks that can be registered viz. trademarks and service marks. Trademarks are used by their owners to identify goods, whereas service marks are used by their owners to identify services. **HYUNDAI, KIA, *Coca Cola*, Sony, Bajaj, Samsung** etc. are examples of trademarks, whereas **Jio, SBI, LIC, BSNL** etc. are some examples of service marks [9].

After registration the rights becomes statutory rights. Benefit of registering a trademark is that a statutory right is a *prima facie* evidence of ownership of the right. A mark should be original and distinctive to get registered. The registration of a trade mark gives the proprietor of the trade mark the exclusive right to the use of the trade mark in relation to the goods or services in respect of which the trade mark is registered and to obtain relief in respect of infringement of the trade mark [9].

Geographical Indications:

A Geographical Indication (GI) is a sign used on goods that have a specific geographical origin and often possess qualities or a reputation that are due to that place of origin. Many agricultural products have especial qualities that are influenced by geographical environment or soil. "The term Geographical Indication (GI) has been chosen by WIPO includes all existing means of protection of such names and symbols, regardless of whether they indicate that qualities of a given product are due to its geographical origin (such as appellation of origin), or they merely indicate place of origin of a product (such as indication of source) [14].Darjeeling Tea, Assam Orthodox, Basmati Rice, Nagpur oranges, Kanchipuram saris, Muga silk of Assam etc. are some well known examples for names which are associated throughout the world for their product having specific quality and registered as GI. Similarly in the field of handicrafts, textiles, etc., specific qualities of the products are related with human factors and their skills [15]. Mysore silk Kashmiri handicrafts, etc are well known examples of GI for state of the art craftsmanship [7, 16].

In India, registration of such manufactured goods can be done under Geographical Indication of goods (registration and protection) Act

1999 and Geographical Indication of goods (registration and protection) rules 2001.Under these rules protection under GI is granted for 10 years and renewal is possible time to time for further 10 years [10].

Layout Design for Integrated circuits:

Semiconductor Integrated Circuit means a product having transistors and other circuitry elements, which are inseparably formed on a semiconductor material or an insulating material or inside the semiconductor material and designed to perform an electronic circuitry function.

In India, Semiconductor Integrated Circuits Layout Design Act 2000 is to provide protection of Intellectual Property Right (IPR) in the area of Semiconductor Integrated Circuit Layout Design and for matters connected therewith or incidental thereto. The main focus of SICLD Act is to provide for routes and mechanism for protection of IPR in Chip Layout Designs created and matters related to it. The SICLD Act empowers the registered proprietor of the layout-design an inherent right to use the layout-design, commercially exploit it and obtain relief in respect of any infringement. The initial term of registration is for 10 years; thereafter it may be renewed from time to time. Department of Information Technology Ministry of Communication and Information Technology is the administrative ministry looking after its registration and other matters [17].

New Plant Varieties Protection & Farmers Rights:

Crop species of new and derived varieties are protected under this type of IPR. Also, rights of farmers in conserving, improving and making available plant genetic resources for the development of the new plant varieties are protected too. It allows farmers to save, use, exchange and sell farm-saved seed ensuring the good quality. The Govt. of India enacted The Protection of Plant Varieties and Farmers' Rights Act, 2001.Under this Act farmers and plant breeders get exclusive rights to produce, sell, market, distribute, import or export the protected plant variety. A variety is eligible for registration if it

essentially fulfills the criteria of Distinctiveness, Uniformity and Stability. The term of protection for a variety varies from 6-18 years depending upon certain conditions [18].

[B] Copy Right:

Copyright is a legal term describing rights given to creators for their literary and artistic works (including computer software). Related rights are granted to performing artists, producers of sound recordings and broadcasting organization in their radio and television programmes. Development of any country or society depends upon creativity of their people. This copyright encourages such type of activities. The following literary and artistic works are covered under copyrights [14]:

- **Literary and scientific works:** novels, poems, reference works, newspapers, plays, books, pamphlet, magazine, journals, etc.
- **Musical works:** songs, instrument musical, choruses, solos, bands, orchestras, etc.
- **Artistic works:** such as painting, drawings, sculpture, architecture, advertisements, etc.
- **Photographic work:** portraits, landscape, fashion or event photography, etc.
- **Motion pictures:** it includes the cinematography works such as film, drama, documentary, newsreels, theatrical exhibition, television broadcasting, cartoons, video tape, DVDs, etc.
- **Computer programs:** computer programmer, software and their related databases, Maps and technical drawings.

The registration of copyright is carried out under the Indian Copyright Act, 1957.Recently the act was amended in 2012 known as The Copyright (amendment) Act, 2012. As per rule, author gets copy rights just after creating its work without any formality but work can be registered at Register of copyrights maintained in the Copyright office of Department of Education as prima-facie evidence [10]. In India, for literary work, the protection exists throughout the lifetime of author and 60 years more after death. For Cinematographic films,

records and photographs, protection stays till 60 years but for broadcasting it stays till 25 years. Besides these, author also gets moral rights for its creations.

Conclusion

In wake of globalization, it is utmost important to be ahead in innovations and creativeness to compete the stiff competitions in technology and trade. India is well recognized for its intellectual skills in the fields of software engineering, missile technology, Moon or Jupiter mission and other technological areas. However, India lags in generation of IPR assets in terms of registered patents, industrial design, trademarks etc. The Intellectual property rights are very much important for progressive societal development. India is having all the resource in terms of available raw material, cheap labour, innovative and creative dedicated manpower. There is no question that by pursuing intellectual property Rights, India and other developing countries will certainly leverage its proportionate share of world trade.

Reference

1. What is intellectual property? WIPO Publication No. 450(E).Available at: http://www.wipo.int/freepublications/en/int property/450/wipo-pub-450.pdf. Data accessed: 12 Nov. 2011.
2. Andersen, B. (2006).Introduction. In: Intellectual property rights: innovation, governance and the institutional environment Ist ed. Cheltenham: Edward Elgar Publishing, Ltd.; p 6
3. Rout, S.K. (2018). A brief review on intellectual property rights with special attention on patent. *Journal of Applied and Advanced Research*, 3(3); 72-77
4. WIPOManual:WhatisIntellectualproperty? http://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo-pu-b 450.pdf.
5. www.wipo.int/ipstats/en/statistics/patents/wipo-pub-931.html
6. Nair, M.D; TRIPS; WTO and IPR-World Patents. *Journal of Intellectual Property Rights*, 15; 151-153.

7. Cuts International Jaipur (2007). Intellectual property rights, biodiversity and traditional knowledge, *Monographs on Globalization and Indian-Myths and Realities*, 13; 20-22
8. Introduction to Intellectual Property (2011).Controller General of Patents, Designs &Trade Marks, India. Available at: http://ipindia.nic.in/ipr/patent/patents-filin g.pdf. Data accessed: 23 Oct.2011.
9. Mathur,V. (2012).Intellectual Property Rights and Their Significance in Biomedical Research. *International Journal of Biomedical Research*, 3(02); 74-78.
10. Jajpura, L.; Singh, B. and Nayak, R. (2017).An Introduction to Intellectual Property Rights and their Importance in Indian Context. *Journal of Intellectual Property Rights*, Vol.22, pp 32-41
11. Controller General of Patents, Designs and Trademarks, Department of Industrial policy and promotion, ministry of commerce and industry website: http://www.ipindia.nic.in/ (accessed on 30 December 2014).
12. The Patents (Amendment) Act, 2002, No 38 of 2002 (June 25, 2002).
13. The Trade marks Act, 1999, No 47 of 1999 (Dec. 30, 1999).
14. Lengare, K. (2020).Importance of Intellectual Property Rights in Indian Situation. *Knowledge Resonance*, Vol. 9(1); 45-54.
15. Mir F A & Ain F, Legal protection of geographical indication in Jammu and Kashmir- a case study of Kashmir Handicrafts. Journal of Intellectual Property Rights, 15; 220-227.
16. www.wipo.int/wipolex/en/text.jsp?file-id=208015 (accessed on 1May 2015).
17. Savale, S. and Savale, S. (2016). Intellectual Property Rights (IPR). *World Journal of Pharmacy and Pharmaceutical Sciences*, 5(6); 2529-2559
18. The Protection of Plant Varieties and Farmers' Rights Act, 2001, No53 of 2001 (Oct.30, 2001)

A Review Article on Exploring Research Methodology

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Abstract

A research methodology is a systematic approach to tackling a research topic. It may be conceived of as a science that investigates how scientific research is conducted. We examine the many processes employed by a researcher in order to study his research subject, as well as his motives for doing so. The researcher must comprehend not just the study's methods and processes, but also its strategy. Researchers must understand not only how to create specific indices or tests, compute the mean, mode, median, standard deviation, or chi-square, and employ specific research methods or techniques, but also which methods or techniques are relevant and which are not, as well as what they imply and signal and why. Researchers must also grasp the assumptions underpinning diverse methods, as well as the criteria used to determine whether some techniques and processes are appropriate for specific difficulties and others are not. All of this suggests that the researcher must develop his or her own strategy to the topic, since it may differ from one to the next.

Keywords:

Research Methodology, Qualitative research, Research Techniques, Quantitative Research, Research, Methodology

1. Introduction

The term "research" refers to the process of looking for information. A scholarly and diligent pursuit of relevant knowledge regarding a specific subject is referred to as research. In reality, research is a form of scientific inquiry. "a diligent research or inquiry, particularly through quest for fresh material in any topic of study," according to the Advanced Learner's Dictionary of Current English. [1] According to Redman and Mory, research is a "systematised endeavour to gather new information." [2] Methodology is a comprehensive, theoretical examination of the approaches used in a particular field of study. It consists of a theoretical assessment of a set of methodologies and concepts in a certain field of knowledge. Commonly used terms include paradigm, theoretical model, stages, and quantitative or qualitative techniques. [3] Research methodology is the study of how scientific research is conducted. A strategy for taking several actions logically in order to systematically answer to the research topic. Methodology may help us understand not just the results of scientific study, but also the process itself. The goal of research methodology is to discover and evaluate processes, to enlighten and clarify their limitations and resources, to define their presuppositions and implications, and to connect their potentialities to the twilight zone of "frontiers of knowledge." [4]

2. Objectives of Research

The goal of research is to use scientific methods to find answers to problems. The primary goal of research is to unearth long-buried facts that have yet to be found. Despite the fact that each research project has its own distinct goal, we may categorise research aims into the following major categories:

1. becoming familiar with a phenomenon or getting new insights into it (studies with this goal are known as exploratory or formulative research studies);
2. To accurately describe the characteristics of a certain individual, event, or group (studies having this purpose in mind are referred to as descriptive research studies);

3. determining the frequency with which something occurs or is related to something else (studies with this goal are known as diagnostic research studies);
4. To put a theory regarding a causal relationship between variables to the test (known as a case study). [5]

3. Types of Research

Time, purpose, surrounds, place, and technique are all factors that may be used to classify research. Some researches are comparable, but others vary slightly. However, each type of research has its own set of implications.

3.1 Basic Research: Pure research is another term for it. Basic research is described as research done to enhance one's understanding. It is done in order to overload the unknown information. It is concerned in both generalisations and the creation of new ideas. While fundamental research does not yield instant results or answers, it does contribute to scientific understanding. Though its work is now limited, it has the potential to expand in the future.

3.2 Applied Research: It is also known as "need-based research" or "practical research." The primary goal is to solve problems that an institution, community, business, or government agency is currently facing. Applied research covers investigations of social, political, and economic events that have a negative impact on a range of domains. The majority of secondary data is used in this type of investigation.

3.3 Empirical Research: At times, it is also referred to as "experimental research." Primary data is collected, analysed, and evaluated here, as well as hypothesis testing. Before commencing his inquiry, the researcher should establish his experimental designs and present working hypotheses in order to get a satisfying result.

3.4 Qualitative Research: This study, as the name implies, focuses on the qualitative process. Its most common use is in the study of human behaviour. By observing the opposite person, one may learn about their body language, attitude, ideas, sentiments,

and so on. It will be most useful to psychiatrists and interviewers. Word association tests, phrase completion, sketching images, and the Thematic Apperception Test are among the methods employed. When quantitative research fails, qualitative research is required. As a result, it's also known as "Motivation Research."

3.5 Quantitative Research: The quantitative measurement of phenomena is the primary focus of this study. The difference between qualitative and quantitative language is sometimes erroneous. Conducting surveys to collect population, social, and economic data on a given location is an example of quantitative research. They will be analysed quantitatively. It is mostly dependent on primary data sources, such as survey and questionnaire methods. Their interconnectedness, on the other hand, may be demonstrated.

3.6 Descriptive Research: The emphasis of this work, as the name suggests, is on description. It includes a wide range of data collection techniques, such as surveys and fact-finding processes. The researcher has no control over the factors in this investigation, which are crucial. He should talk about what has happened and what is happening presently. Descriptive research is frequently used in ex post facto operations.

3.7 Some other types of research: Aside from the research mentioned above, there are others, such as Longitudinal Research, which spans a lengthy time period. This change is time-consuming. The focus of historical research is the gathering of memoirs, letters, documents, and inquiries in order to understand about the past. The goal of simulation research is to create an artificial environment that is strikingly comparable to the actual one. We may create and adjust to the needs of the circumstance. [6]

4. Significance of Research

- It aids policy development: Research aids in the formulation of various government policies. Researchers assist in the development and implementation of nearly all government programmes and budgets. The government is in charge of

creating the annual budget, monthly budgets, monetary policies, and economic policies. Various organisations do research to help the government develop policy.

- The primary goal is to gather information, which leads to many new ideas and modifies old facts.
- It is utilised in business: Many companies hire researchers to work on a range of initiatives. It is used in the analysis of market developments. It assists in capital budgeting, tax administration, and cost-cutting strategies.
- It contributes to the discovery and advancement of previously unknown facts and theories. It aids in the advancement of society and its inhabitants. It enables the researcher to dive deeply into the issue while also innovating.
- It steers clear of superstitious ideas, myths, and prejudices: Many individuals are still unaware of the significance of research. Many ancient ideas and misconceptions have been debunked via research.
- It promotes social welfare and the growth of society.
- PhD students can use it to assist them in writing their thesis. As a result, research is a source of information that assists in the development of all government programmes, the settlement of business difficulties, the avoidance of superstitious beliefs, and the growth and maturation of society and its citizens. [6]

5. Research Process

1. **Formulating the research problem:** Understanding the problem and rephrasing it into analytically appropriate language are the first two phases in framing the study challenge. The researcher must first determine the topic he want to explore, i.e. the broad area of interest or facet of a subject into which he wishes to dive.
2. **Extensive literature survey:** A succinct statement of the problem should be put down once it has been formulated. At this point, the researcher should do a thorough literature review on the subject. Depending on the nature of the topic, academic

publications, conference proceedings, government papers, books, and so on must be consulted.

3. **Developing a working hypothesis:** A hypothesis is a provisional claim or conjecture about the answer to a research topic. It defines the sort of data that will be collected as well as the study's method or procedures. Certain types of research, such as exploratory or formulative research, may or may not include hypothesis testing. [6]
4. **Preparing the research design:** The purpose of study design is to allow for the collecting of relevant evidence with the least amount of effort, time, and money. There are several study designs available, including experimental and non-experimental hypothesis testing. If the objective of the research study is exploration, a flexible research design that allows for the consideration of many distinct facets of an issue is regarded acceptable. [5]
5. **Determining sample design:** The sample design is the process through which the researcher selects how to select a sample. A sample design, in other words, is a detailed technique designed prior to data collection in order to get a sample from a specified population. The sample designs displayed here are a condensed selection of the most important sample designs.
   - Simple random sampling
   - Sequential sampling
   - Deliberate sampling
   - Systematic sampling
   - Quota sampling
   - Stratified sampling
   - Multi-stage sampling
   - Cluster sampling and area sampling
6. **Collecting the data:** The method of gathering or collecting the data is planned in data collection design. There are many types for collecting the data. The two types of collecting data are Primary data and Secondary data. Some of the important methods for collecting the Primary data are as follows:

1. **Questionnaire:** The Questionnaire approach is used to collect data in large geographical areas. As a result, questionnaires are shipped to study locations and disseminated to responders. It is a time-saving and cost-effective strategy, but the primary disadvantage is that the responses provided by respondents are inaccurate.
2. **Interview:** The investigators compose a series of questions and ask them to the respondents in a sequential order. Personal, group, mock, and telephone interviews are all forms of interviews. It is a quick operation. We can obtain further information relevant to the issue. However, it is expensive. Some responders may try to conceal their replies. It saves the investigator a lot of time.
3. **Observation:** The researcher may be expected to engage in the process at times. It sheds light on the respondent's human behaviour. Secondary data can be gathered via books, published papers, the internet, and syndication services. The disadvantage of this technique is that the researcher will not profit from further information, and it is highly costly.

7. **Execution of the project:** Following the creation of a proper design for the research process, the researcher should move on to the next step of implementation. The researcher now begins carrying out the study strategy. Surveyors should be trained and given a working manual. Collecting data should be done with prudence. [6]
8. **Analysis of data:** Soon after the collection of data, the researcher turns to the process of analyzing the collected data. The raw data will be tuned. There are many things used for analysis like coding, tabulation, editing and statistical analysis. Data will be collected in the form of questionnaires or schedules. Hence the data collected in short forms will be elaborated through coding. Editing can be done at the time of collecting or collecting the data. Through editing the researcher removes all the mistakes in the project. It will be polished. Through tabulation the researchers do the work of preparing the tables.

9. **Hypothesis-testing:** Following data analysis, a researcher may revisit any ideas he may have developed before. Statistical tests such as the Chi square test, t-test, and F-test have been devised for this purpose by statisticians. If the researcher began with no hypotheses, generalisations based on data may be characterised as hypotheses.
10. **Preparation of the report or the thesis:** Finally, the researcher must write a report on what he has done. The following factors must be considered while writing a report:
    1. The layout of the report should be as follows:
    i. the preliminary pages;
    ii. the main text, and
    iii. the end matter.

The title and date should appear on the first page of the report, followed by acknowledgements and the preface. The report should then include a table of contents, a list of tables, and, if relevant, a list of graphs and charts. The following sections should be included in the primary text of the report:

a. Introduction: It should include a clear statement of the aim of the study as well as an explanation of the method employed to conduct the research. This part should also provide a summary of the scope of the investigation as well as its limitations.
b. Summary of findings: Following the introduction, a statement of results and suggestions in non-technical language would emerge. If the research is comprehensive, it should be summarised.
c. Main report: The major content of the report should be presented logically and divided into easily recognisable sections.
d. Conclusion: Toward the end of the main paragraph, the researcher should clearly and exactly summarise the findings of his research. In fact, it is the final summing up.

11. Research Approach

Research approach can be divided into three types:
1. Deductive Research approach
2. Inductive Research approach

3. Abductive Research approach

The key contrast between deductive and inductive methods is the application of hypotheses to the investigation. The deductive technique assesses the validity of the assumptions (or theories/hypotheses) under consideration, whereas the inductive method produces new ideas and generalisations. Abductive research, on the other hand, begins with "surprising facts" or "puzzles" and devotes the study process to comprehending them. [7] You are employing a deductive technique if you have developed a set of hypotheses for your dissertation that must be validated or rejected during the research process. The inductive approach, on the other hand, does not necessitate the establishment of assumptions. It all starts with research questions and the goals and objectives that must be satisfied throughout the research process. The abductive research approach focuses on the explanation of specific "incomplete observations," "surprising facts," or "puzzles."

Criteria of Good Research

Whatever the nature of the research activities and studies, one thing is certain: they all share the same scientific foundation. Scientific research is expected to meet the following requirements:

1. The study aim should be expressed clearly, and common ideas should be employed.
2. The study strategy should be detailed enough enable another researcher to continue the research for future development while maintaining the continuity of what has previously been achieved.
3. The research approach should be well-organized in order to obtain the most objective results feasible.
4. The researcher should be candid about shortcomings in procedural design and evaluate their impact on the findings.
5. Data analysis must be competent in order to demonstrate the relevance of the data, and the methods of analysis used must be acceptable. The validity and dependability of the data should be properly checked.
6. Conclusions should be confined to those that are supported by the study findings and have a solid foundation in the facts.

7. More faith is merited in research if the researcher is experienced, has a strong research reputation, and is a person of integrity. [5]

Conclusion

Research is a journey of discovery; it is an attitude; it is an experience; it is a critical thinking style; and it is an activity motivated by a desire to obtain new insights/answer questions/acquire information.

References

1. The Advanced Learner s Dictionary of Current English, Oxford, 1952.
2. L.V. Redman and A.V.H. Mory, The Romance of Research, 1923.
3. Irny, S.I. and Rose, A.A. (2005) "Designing a Strategic Information Systems Planning Methodology for Malaysian Institutes of Higher Learning (isp- ipta), Issues in Information System, Volume VI, No. 1, 2005.
4. https://www.researchgate.net/publication/39168208_Research_Methodology_Part_1_Introduction_to_ Research_Research_Methodology.
5. C.R. Kothari, Research Methodology Methods and Techniques, ISBN (13): 978-81-224-2488-1, 2004.
6. Pavan G. K. and Dr. Nagarekha Kulkarni, Review Article on Research Methodology, International journal of innovative research and development, Vol. 3 Issue 7, 2014.
7. Bryman A. & Bell, E. "Business Research Methods" 4th edition, Oxford University Press, 2015.
8. The National Academies of Sciences Engineering Medicine, Fostering Integrity in Research, 2017.

Importance of Literature Review in Research

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Abstract

A literature review summarizes and synthesizes the existing scholarly research on a particular topic. Literature reviews are a form of academic writing commonly used in the sciences, social sciences, and humanities. However, unlike research papers, which establish new arguments and make original contributions, literature reviews organize and present existing research..It may be said that, a literature review isan overview of the previously published works on a particular topic. Moreover, a literature review can be a type of review article. In this sense, a literature review is a scholarly paper that presents the current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic.Literature reviews are a basis for research in nearly every academic writing.A literature review can be just a simple summary of the sources, but it usually has an organizational pattern and combines both summary and synthesis. And depending on the situation, the literature review may evaluate the sources and advise the reader on the most pertinent or relevant.A researcher acquires expertise on a specific area mainly through extensive and intensive unique literature review. The present paper is an attempt to highlight about the importance of literature review in research.

Keywords: Literature review,originalcontributions,scholarly paper, academic writing, researcher, expertise.

Introduction

Research is a scientific and systematic search for pertinent information on a specific topic. It is the persuit of truth with the help of study, observation, comparison and experiment. The search for knowledge through objective and systematic method of finding solution to a problem is regarded as research. The systematic process concerning generalization and the formulation of a theory is also research. Research is, thus, an original contribution to the existing stock of knowledge making for its advancement. Thus, research stands to the systematic process consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solutions towards the concerned problem.

Doing a careful and thorough literature review is essential of research at any level. It not only surveys what research has been done in the past on your topic, but it also appraises, compares, contrasts, and correlates various scholarly books, research articles, and other relevant sources that are directly related to your current research.

A literature review is regarded as a comprehensive summary of previous research on a particular topic. Thus, the literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe, summarize, objectively evaluate and clarify this previous research. Itgives a theoretical base for the research and help the researcherto determine the nature of his research. The literature review acknowledges the work of previous researchers. It is assumed that by mentioning a previous work in the field of study, that the researcher has read, evaluated, and assimilated that work into the work at hand.A literature review creates a "landscape" for the reader, giving her or him a full understanding of the developments in the field. This landscape informs the reader that the author has indeed assimilated all previous, significant works in the field into her or his research.

Objectives of the study

To discuss about the concept of literature review in academic

writing.

To understand the importance of literature review in research.

To know the steps in conducting a literature review.

Methodology

The studyisbased on thesecondary information collected from related sources. The secondary data are collected from different sources like books, journals, internet, etc. Apart from this, the analytical and descriptive methods are used in this study.

Purpose of literature review

The purpose of a literature review is to gain an understanding of the existing research and debates relevant to a particular topic or area of study, and to present that knowledge in the form of a written report. Conducting a literature review helps us to build our knowledge in a particular field. Through this literature review one can learn about important concepts, research methods, and experimental techniques that are used in researcher field. Another great benefit of literature reviews is that as you read, you'll get a better understanding of how research findings are presented and discussed in your particular discipline. If you pay attention to what you read and try to achieve a similar style, you'll become more successful at writing for your discipline. Understanding the state of things literature reviews are often found at the beginning of research articles. This is because the literature review shows the reader where the research community is up to in researching that topic and highlights gaps in the existing research. The research article then addresses those gaps through new research. Researchers conduct a literature review to identify the areas of a topic that have not yet been researched in detail. They then go and do the research to fill the research gap. This is how researchers contribute to the development of knowledge on their topic.

Literature review is a description of what has been published on a particular subject by scholars, researchers and the scientific community. The following are the some of the necessity of literature review -

- It describes how the proposed research is related to prior research in statistics.
- It shows the originality and relevance of the research problem.
- It justifies the proposed methodology.
- It demonstrates researchers' preparedness to complete the research.
- The literature review is one of these important academic requirements.

The Processes of Literature Review

A literature review is a fundamental part of our academic writing process. A literature review is an account of what has been published on a topic by accredited scholars and researchers.In writing the literature review, your purpose is to convey to your reader what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are.Some of the processes of literature review are given as follows -

- Determine the clear purpose of review.
- Search, access and gather literature.
- Notice similarities and differences in terms of methodologies, philosophies, claims, choice and interpretation of evidence, reli ability, etc.
- Observe gaps in research or areas that require further study.
- Note any particular issue or problem that stands out.
- Avoid going back and forth and changing direction and focus of review / research problem.
- Note significance of each work to the research problem.

Importance of literature review in research

The importance of literature review cannot be overlooked because it gives direction, structure, focus, and coherence to academic writing on a particular topic. It also allows for effective communication among researchers by helping them to decide which issues are significant. It permits the researcher to situate his or her work within the existing body of knowledge.There are four main functions of literature review; bring clarity and focus to research problem, im-

prove research methodology, increase knowledge regarding the research topic, and build on your findings. The importance of literature review in research are given as follows -

- Literature review helps establish acontext for research
  One of the main objectives of the literature review is to provide a context for the research. It puts the current research in perspective and shows how it relates to what has been done before. It also identifies the gaps in the existing body of knowledge and helps to formulate new research questions.
- Literature review helps identify the theoretical framework
  The theoretical framework provides the conceptual underpinnings of the research and literature review is a key component in identifying it. It helps to clarify the rationale for the study and shows how the research is linked to existing theory.
- Literature review helps clarify research questions
  One of the main functions of the literature review is to help researchers formulate clear and concise research questions. By reading extensively about a topic, researchers can develop well-defined questions that can be addressed through their research.
- Literature review helps assess the quality of previous research
  A literature review allows researchers to critically assess the quality of previous research on the topic. It enables them to judge the strengths and weaknesses of the previous studies and to decide whether they should build upon or replace them.
- Literature review helps comparing different studies
  A literature review helps researchers to compare and contrast existing research on a particular topic to draw better conclusions from it. It also shows how different studies are related and explains why some questions have received more attention than others.
- Literature review gives context to the research study
  The literature review provides context for the research study that follows by showing its connection with what has already been published on the subject. It lays out the most significant issues in the field, describes them clearly, and explains why they are important. This allows readers to understand all subsequent research

within this context, thus giving it greater impact.

- Literature review helps to identify problems
  One of the main benefits of the literature review is that it helps researchers to identify problems, issues, or controversies in the existing body of knowledge on their topic. It then allows them to address these concerns in their work and broaden the scope of research by contributing new ideas and insights.
- Literature review provides amap for future research
  A literature review can also be useful for laying out a road map for future research studies. It identifies gaps in previous research studies and provides information about areas where further investigation is needed.
- Literature review enables researchers save time
  A well-done literature review can help researchers to save time by identifying relevant studies and steering them away from those that are not. It also allows them to focus on the most important issues and avoid unnecessary duplication of effort.
- Literature review helps in development of new research methods
  The process of reviewing the existing literature can help researchers to develop new research methods and to improve upon existing ones. By reading extensively about their topic, they may come up with new ways of looking at things that can then be tested in their research study.
- Literature review helps in the design of new studies
  The design of a research study is based upon the theoretical framework, which in turn is based upon the findings of the previous literature review. By reading extensively about their topic, researchers can come up with well-defined research questions as well as variables and hypotheses.
- Literature review help evaluating the outcomes of another study
  Another major benefit of the literature review is that it can help in evaluating the outcomes of another study. This is especially true for those studies that use quantitative methods since they generally provide more objective data than qualitative studies do. It also helps readers to understand the merits and shortcomings of a

particular study and thus arrive at a reliable judgment about its worth.

- Literature review helps in realizing importance of validity and reliability

  The process of literature review makes readers more aware of the importance of validity and reliability. It shows how these two characteristics can influence research results and thus help them to make informed decisions about whether or not to include specific studies in their work.

- Literature review helps to develop understanding about anew topic

Another benefit of the literature review is that it helps researchers explore complex topics, which they may be unfamiliar with at first. By reading about these topics, they can develop an understanding of what research has been conducted on the topic and how it has been conducted. This, in turn, can help them to develop their research study.

Conclusion

In the conclusion, it may be pointed out that, literature review is an important process that helps researchers to develop a better understanding of their topic and the existing body of knowledge on it. It also helps them to identify potential problems and issues that may need to be addressed in their research study. Hence, it is something that should not be taken lightly and should be given the attention that it deserves.A literature review is a piece of academic writing demonstrating knowledge and understanding of the academic literature on a specific topic placed in context. A literature review also includes a critical evaluation of the material; this is why it is called a literature review rather than a literature report. It is a process of reviewing the literature, as well as a form of writing.

References

Allen, T. Harrell. *New methods in Social Science Research.* New York: Praeger Publishers, 1978. Print.

Best, John W. and Kahn, James V. *Research in Education.* New Delhi: Prentice- Hall of India Pvt. Ltd., 1986. Print.

Kothari, C. R. *Research Methodology.* New Delhi: New Age International (P) Ltd., Publishers, 2011. Print.

Saxena, V. P. *Lecture Notes on Research Methodology.* Bhopal: Indra Publishing House, 2001. Print.

Sharma, K. R. *Research Methods.* New Delhi: Atlantic Publishers and Distributors (P) Ltd., 2019. Print.

Snyder, Hannah. "Literature review as a research methodology: An overview and guidelines." *Journal of Business Research.* 104 (2019): 333-339. Web. 1st Dec. 2022. <https://doi.org/10.1016/j.jbusres.2019.07.039>

Whitney, F. L. *The Elements of Research.* New York: Prentice-Hall, 1950. Print.

A Review on Research Methodology

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Abstract:

Research Methodology is the systematic way to find out the solution to a problem. Essentially it is the procedure carried out by researchers to go about their work of explaining and predicting occurrences. Providing the work plan to research is the aim of research methodology. It is necessary not just to identify the problem for research but to determine the best methods to solve that problem as well. Research methodology provides training in choosing methods, scientific tools and techniques relevant to the solution of the problem. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. The scope of research methodology is wider than that of research methods, as the latter is the part of the former. Researchers not only to know how to develop certain indices or tests, how to calculate the mean , the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques are relevant and which are not and what would they mean and indicate and why. A Good research is replicable, reproducible and transparent. Replicability, reproducibility and transparency are some of the most important characteristics of research. The replicability of a research study is important because this allows other researchers to test the study's findings. Replicability can also improve the trustworthiness of a research's findings among readers. Though replicability and reproducibility are often used interchangeably, research is reproducible if researchers achieve consistent results using the same data and analysis methods. For research to be replicable or reproducible, it must also be transparent or available to other researchers. Research must be written or presented in such a way that it provides comprehensive details on how data was collected and analyzed and how conclusions were reached.

Keywords :

Research, Methodology, Research Methodology, Research techniques, replicable, reproducible, transparent.

Introduction:

Research is creative and systematic work undertaken to increase the stock of knowledge. It involves the collection, organization and analysis of information to increase understanding of a topic or issue. Once can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. Redman and Mory define research as a "Systematized effort to gain new knowledge." One definition of research is used by the OECD, "Any creative systematic activity undertaken in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this knowledge to devise new applications." According to John W. Creswell, "Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue." It consists of three steps: pose a question, collect data to answer the question and present an answer to the question.

Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. Typically, it encompasses concepts such as paradigm, theoretical model, phase and quantitative or qualitative techniques. Bowling (2002) explains that methodology is the complete structure of the research study; the size and sample methods, the practices and techniques utilized to collect data and the process to analyze data.

Research methodology is the specific procedures or techniques

used to identify, select, process and analyze information about a topic. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by researcher in studying his research problem along with the logic behind them.

Objectives of Research:

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it ——Exploratory or Formulative Research.
2. To portray accurately the characteristics of a particular individual, situation or a group ———Descriptive Research.
3. To determine the frequency with which something occurs or with which it is associated with something else————diagnostic research.
4. To test a hypothesis of a causal relationship between variables——Hypothesis–Testing Research.

Types of research:

Research can be classified on the basis of time, purpose, settings, place and technique. Some researches have similarities and some have little variations. But all the types of research have its own significance.

Basic Research:

Basic research is a type of research approach that is aimed at gaining a better understanding of a subject, phenomenon or basic law of nature. This type of research is primarily focused on the advancement of knowledge rather than solving a specific problem. Basic research is also referred to as pure research or fundamental research.The primary aim of this research approach is to gather

information in order to improve one's understanding and this information can then be useful in proffering solutions to a problem.

Applied research:

Applied research is a type of research design that seeks to solve a specific problem or provide innovative solutions to issues affecting an individual, group or society. It is often referred to as a scientific method of inquiry or contractual research because it involves the practical application of scientific methods to everyday problems. When conducting applied research, the researcher takes extra care to identify a problem, develop a research hypothesis and goes ahead to test these hypothesis via an experiment.

Empirical research:

It is often referred to as experimental research. In this primary data is collected, analyzed, interpretation is done and subjected to hypothesis testing. Researcher should develop his experimental designs and should provide working hypothesis before the commencement of his research for good output.

Qualitative research:

Qualitative research is collecting, analyzing and interpreting data by observing what people do and say. Qualitative research is subjective and uses very different methods of collecting information, including individual, in-depth interviews and focus groups. The nature of this type of research is exploratory and open-ended. It is mainly helpful for Psychiatrists and interviewers. Many techniques are being used like word association test, sentence completion, drawing pictures, Thematic Appreciation Test. Through such research we can analyze the various factors which motivate people to behave in a particular manner or which make people like or dislike a particular thing. So this type of research is also known as 'Motivation Research'.

Quantitative Research :

Quantitative research is based on the measurement of quantity or

amount. Quantitative research collects and uses numerical data to explore, describe, explain, or predict trends or phenomena. Quantitative research states hypotheses and relies on statistical analysis to support conclusions made regarding the hypotheses. Quantitative research is widely used in natural and social sciences: biology, chemistry, psychology, economics, sociology, marketing etc.

Descriptive Research:

Descriptive research is used to describe characteristics of a population or phenomenon being studied. It includes different data collection like survey method and fact-finding techniques. The main characteristics of this research is that the researcher does not have control over the variables. He should describe what has happened and what is happening. Most ex post facto research projects are used for descriptive studies in which the researcher seeks to measure such items as for example, frequency for shopping,preferences of people, or similar data.

Analytical Research:

Analytical research uses the facts that have been confirmed already to form the basis for the research and critical evaluation of the material is carried out in this method. Analytical methods make use of quantitative methods as well.

Some other types of research:

Apart from the above types of research, there are many other classifications like

Longitudinal Research:

Longitudinal research is a long-term study that can last for months or years. Longitudinal studies are designed to chart and monitor change over time. These studies typically gather a set of data at the study's beginning and then repeatedly gather data on the same topic throughout the course of the study.

Historical Research:

Historical research is a qualitative technique. Historical research studies the meaning of past events in an attempt to interpret the facts and explain the cause of events and their effect in the present events. In doing so, researchers rely heavily on primary historical data (direct accounts of events, archival data-official documents, personal records, and records of eyewitnesses) and less frequently on secondary historical data (information from persons who did not witness the event; e.g. textbooks, newspapers, encyclopedias).

Simulation Research:

Simulation research deals with the creation of an artificial environment which is quite similar to real environment. Depending upon the need of the situation we can create and adjust to it.

Significance of research:

Research inculcates scientific and inductive thinking and it promotes the development of logical habits of thinking and organization.

Research helps in the framing of various government policies. Nearly all the government policies and budgets are planned and executed through research with the help of researcher.

Research is used in business organization. Many business companies hire researcher to work on various things. It is used in studying the changes taking place in the market. It helps in capital budgeting, tax management and cost saving policies.

Research is equally important for the social scientists in studying social relationships and in seeking answers to various social problems. It provides the intellectual satisfaction of knowing a few things just for the sake of knowledge and also has practical utility for the social scientist to know for the sake of being able to do something better or in a more efficient manner.

Research avoids superstitious beliefs, myths and prejudices. Many people are still not aware of the research activities and its importance. Many ancient beliefs and myths have been proven wrong with the help of research.

Research is useful for PhD students to write their thesis. Research may mean a source of livelihood for the professionals in research methodology.

Research Process:

It consists of a logical sequence of steps or actions that are necessary to effectively solve a research problem.

(i) **Formulating the research problem:** The researcher must choose the problem he wants to study and decide the area of interest and subject matter he would inquire about.

(ii) **Extensive literature survey:** After choosing the research problem an extensive literature survey is done and a brief summary of the problem is written down.

(iii) **Development of working hypothesis:** A working hypothesis must be stated in clear terms. It can be developed through the following approaches:

- (a) Finding about the origin of the problem and studying its objectives.
- (b) By discussing the problem with colleagues and experts.
- (c) By examining past data and records.
- (d) By review of similar studies and similar problems.

(iv) **Preparing the research design:**The research is designed depending upon its utility and appropriateness for a particular research problem. It involves consideration of the following:

- (a) The means of obtaining the information;
- (b) The availability and skills of a researcher;
- (c) Accuracy, Reliability, and Validity of the data;
- (d) The time available for research; and
- (e) The cost related to the research.

(v) **Determining sample design:** The researcher must decide the way of selecting a sample or what is popularly known as the sample design. In other words, a sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population. Sampling can either be

probability sampling or non-probability sampling. The researcher must carefully choose the sampling procedure and sample size and must also look out for sampling errors. A brief mention of the important sample designs is as follows:

- (a) Deliberate sampling
- (b) Simple random sampling
- (c) Systematic sampling
- (d) Stratified sampling
- (e) Quota sampling
- (f) Cluster sampling and area sampling
- (g) Multi-stage sampling
- (h) Sequential sampling

(vi) **Collecting the data:**There is a need for reliable and accurate data to carry out effective research. The method of gathering or collecting the data is planned in data collection design. There are many types for collecting the data. The two types of collecting data are primary data and secondary data.

Some of the important methods for collecting the primary data are as follows:

Questionnaire: The method of collecting data in vast geographical areas is done through questionnaire method. Hence questionnaires are mailed to the respondents with a request to return after completing the same. It is the most extensively used method in various economic and business surveys.

Interview: The investigators prepare a set of questions and ask them in a serial wise to the respondents. There are different types of interview like personal, group, mock and telephone interview. It is a fast procedure. It saves much time of the investigator.

Observation: This method implies the collection of information by way of investigator's own observation, without interviewing the respondents. The information obtained relates to what is currently happening. It cannot predict the happenings of the future. This method is no doubt an expensive method and the information provided by this method is also very limited.

Schedules: Under this method the enumerators are appointed

and given training. They are provided with schedules containing relevant questions. These enumerators go to respondents with these schedules and data are collected by filling up the schedules by enumerators on the basis of replies given by respondents.

The secondary data can be collected through magazines, newspapers, journals, books and internet.

(vii) **Execution of the project:** After preparing a good design for the process of research, the researcher should move on to the next step of execution. The project must be systematically executed in order to collect correct and accurate data.

(viii) **Analysis of data:** Analysis of data involves the application of many tools and techniques to the raw data to make meaningful and useful interpretations. The main task includes the establishment of categories, tabulation of data and drawing out statistical inferences.

(ix) **Hypothesis testing:** After analyzing the data the researcher tests the hypothesis formulated by him in the earlier stage. Do the facts support the hypothesis or they happen to be contrary? This is the usual question which should be answered while testing hypotheses. Various tests such as Chi square test, t-test, F-test, have been developed by statisticians for the purpose. The hypotheses may be tested through the use of one or more of such tests, depending upon the nature and object of research inquiry. Hypothesis testing will result in either accepting the hypothesis or in rejecting it.

(x) **Generalizations and interpretation:** The hypothesis testing may be favorable or unfavorable. The researcher arrives at generalizations based on the result of the hypothesis testing. If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation. The process of interpretation may quite often trigger off new questions which in turn may lead to further researches.

(xi) **Preparation of the report or the thesis:** The layout for a research report should be in the order:

Preliminary pages – The research report must contain the full title and date followed by acknowledgements and foreword in the preliminary pages.

Main body or text –The main text of the report should have the following parts:

a) **Introduction:** It should contain a clear statement of the objective of the research and an explanation of the methodology adopted in accomplishing the research. The scope of the study along with various limitations should as well be stated in this part.

b) **Summary of findings:** After introduction there would appear a statement of findings and recommendations in non-technical language. If the findings are extensive, they should be summarized.

c) **Main Report:** The main body of the report should be presented in logical sequence and broken-down into readily identifiable sections.

d) **Conclusion:** Towards the end of the main text, researcher should again put down the results of his research clearly and precisely. In fact, it is the final summing up.

End matter- The end matter of the report must contain appendices in respect of all technical terms and data used in the report and must end with a bibliography.

Criteria of good research:

1) **It should be systematic –** A research must be structured with specified steps in a specified sequence, according to well defined set of rules.

2) **It should be logical –** A research must be guided by logic reasoning and the logical process of induction and deduction.

3) **It should be empirical –** The research must be related to one or more aspects of real-life situations.

4) **It should be replicable –** Other people must be able to verify and replicate the original research report.

Conclusion:

Research is a process of systematic inquiry that entails collection of data, documentation of critical information, and analysis and interpretation of that data / information, in accordance with suitable

methodologies set by specific professional fields and academic disciplines.

References:

1. Bowling, A. (2002). Research methods in health. Buckingham, UK and Philadelphia, PA: Open University Press.
2. Creswell, J. W. (2008). Educational Research: planning, conducting and evaluating quantitative and qualitative research (3rd Ed.).
3. Kothari, C. R. (2004). Research Methodology-Methods and Techniques, ISBN (13): 978-81-224-2488-1.
4. 'OECD Glossary of Statistical Terms-Research and development UNESCO Definition'. Stats.oecd.org. Archived from the original on 19 February 2007. Retrieved 20 May 2018.
5. Redman, L. V., & Mory, A. V. H. (1923). The Romance of Research.

Understanding Authorship & Plagiarism

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Abstract:

Plagiarism is a serious problem in the academic arena that harms the cause of budding writers destroying not only their creativity but also the value involved in the world of writing. Therefore, through this paper, the scholarintends to foreground the definition, types, reasons and solutions of plagiarism at length. Thereby, the scholar wishes to create an awareness regarding the menace of the same that should contribute in imparting the urgency to control the unethical act. The paper also explains the definition of authorship for which avoidingplagiarism is an unavoidable requirement.

Keywords: Plagiarism, academic, awareness, authorship

Introduction

Authorship and Plagiarism are two related concepts that complement each other. One must understand the meaning and function of an author to claim authorship of an academic written piece. In this context, the concept of plagiarism and the knowledge to avoid the same is imperative to claim authorship. The issue of plagiarism is certainly a critical and complicated problem that hampers the prospect of research and academic progress. Unfortunately, the rising competition in the academic arena and availability of hypertext has enhanced the problem even more in recent years. Therefore, a strict vigil and control is imperative in this regard.

Authorship

The term authorship certainly refers to the originality of writing by an individual. To claim authorship of a piece the individual must

ensure his or her sufficient contribution to the piece and thereby his accountability to the work is ascertained. The contribution of the individual might range from formulating the hypothesis, structuring the experimental design, conducting the statistical analysis to be the writer of the greater part of the text (Publication Manual of APA, 2010, P.18). However, authorship of a piece might be of first author, second author or subsequent authors as per their grades of contribution and agreement. Once published, the author and the work areprotected by copyright acts (protection) in most of the countries.

Plagiarism

The discussion on the concept of authorship naturally leads to the topic of plagiarism. In fact, one of the key conditions to claim authorship is to avoid plagiarism.

The term of plagiarism has been derived from Latin word *Plagiarius* meaning *Kidnapper* which was introduced into English in 1601 by Ben Jonson to indicate literary theft. According to MLA handbook (Eight Ed), "Plagiarism is presenting another person's ideas, information, expressions or entire work as one's own (2016, PP. 6-7). Besides moral and ethical offence, plagiarism is also a crime with legal repercussions in many countries like India. Such intellectual thefts often ruin prospective careers. In simple terms, without proper acknowledgement one can't present any idea, expression or text of other authors in academic circles which is totally against the academic integrity and ethics.

Types of Plagiarism

Plagiarism can be of many types. The most dangerous one is the direct kind of blatant plagiarism where one might present an entire piece of someone else's work as one's own. Rise of online resources is one reason for such crimes. In fact, in many cases of such type of plagiarism, it is noticed that the student buys the papers of others before presenting as their own. Such direct plagiarism totally avoids any form of acknowledgement though total textual representation is condemned as totally unethical and dishonest.

The most common form of plagiarism the partial kind of plagiarism where the author copies part of the text, words and phrases from already published sources without proper acknowledgement. In such extracts, providing quotation marks followed by bracket parenthesis or text citation is mandatory. If this is avoided, it is equally condemnable.

There are also examples of unintentional plagiarism. This is mainly due to lack of knowledge of the need of acknowledgement which grow sometimes from the school days. Such students often fail to record the citation while taking down notes for writing the academic work. This also happens while writing in a second language thereby ending up copying the author's ideas and expression in an effort to copy the structure of an author's sentence (MLA handbook for writers of Resource paper, VII Ed, 2009 P. 55)

Another serious type of plagiarism is known as self-plagiarism. In such cases,often a student refer or repeat part of his/her own previous works without proper acknowledgement. Such kind of recycling of ideas are also recognized as fraud and unethical.

Consequences

Any form of plagiarism is unethical and it invites condemnation in academic circles. Even if one is not punished legally, his/her reputation might take such a hit that his/her career might be ruined due to such acts. In many cases, the culprit might also invite minor punishment to institutional expulsion thereby inviting public embarrassment. The acts of plagiarism also harm the teacher-student relationship that is basically built on trust. Last but not the least, allowing such practice will certainly degrade the quality, productivity and value of such a noble practice of writing that leads the society towards betterment.

Suggestion

One is advised to avoid plagiarism by initiating proper methods of acknowledgement. It starts from proper method of note taking while preparing to write a paper. Thus, the scholar should maintain a

This research is up to study about the mostly used statistics in the research as well aswhy they are preferred to other statistics method.

Key words: Statistics, Research, Data, Hypothesis, Mean.

Introduction:

Research is a scientific way to study the concerns or problems to seek the truth and solutions. Research should be controlled, systematic, objective, unbiased, fact and reliable. The Oxford Dictionary defines that the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. Types Research methodology are given bellow: 1. Quantitative Research, 2. Qualitative Research, 3. Descriptive Research, 4. Analytic Research, 5. Applied Research, 6. Fundamental Research, 7. Exploratory Research, 8. Conclusive Research, 9. Surveys, 10. Case Study. Statistics is simply systematic collection, organisation and analysis of data. It is a tool to achieve objectives of research. Statistics have various methods from collection of data to conclusion of result. All most in all research types, statistics is used in some extent. Statistics can be devide into theoritical and applied statistics. Again applied statististics can devide into two (a)Descriptive statistics with two typws- Measure of central tendency (Mean, Median, Mode) and Measure of variablility (Range, variance and dispersion) and (b) Inferential statistics with two types –Hypothsis testing method and Estimation Testing method.

Objectives:

1) To know the mostly used statistics in research.
2) To know why these statistical methods are used widely.

Research Methodology:

This research is conducted to know about the mostly used in research and its benefits. It is descriptive and analytical. This paper is

based on secondary data which are collectedfrom books, journals, internet etc.

Analysis:

Statistics provide a proper direction to achieve the objectives of a research. There are some statistical method which are mostly or frequently use. Those are, mean, standard deviation, regression,corelation, T test, Chi square test, ANOVA. We will study about the meaning, formula, where can we use those methods and their calculations.

a) **Mean:** Mean is the summation of all variablesdevided by its total no of observation. Mean is a part of central tendency or measure of central value. There are tree types of cental values- Arithmatic mean, Harmonic mean and Geomatri mean. Basically used mean is Arithmatic mean which includes Mean, Meadin and mode. Mean finds the average that means summation of variables devided by number of observations.

   How to calculate:

   Suppose the variables are $X_1, X_2, X_3 \ldots\ldots X_n$ where the number of obsevations are n. Then we can write the mean as-

$$\bar{X}=\frac{\sum Xn}{n}$$

When to use mean:

1) When researcher wants to find a single average or central value of data.
2) Data with equal interval (height, weight, temperature etc.) and scaled(units).
3) When there is normal distribution.

b) **Standard Deviation:** Standard deviation is a part of measure of variations or dispersion. Dispersion has five methods, ie 1, Range, 2. Quartile deviation, 3. Mean deviation, 4. Standard Deviation, 5. Lorenz Curve. Among all those method standard deviation is popularly used. Standard deviation can never be negative. Karl pearson introduced this method in 1823.

How to calculate:

1. Arrange the data in ascending or descending order.
2. Take the assumed mean (which is usually the middle variable) and deviate assumed mean from each item or variables and make it total.
3. Square those each deviations values and make it total.
4. And put those values in formula of standard formula which are given below:

$$\sigma = \sqrt{\frac{\sum d2}{N} - (\frac{\sum d}{N})^2}$$

When to use:

1) When the researcher want to find, how spread his data is from the mean.
2) When data is continuous and not significantly skewed. Then only it become appropriate.
3) When the researcher wants to find the uniformity as well as homogeneity of a series.
4) To find Accuracy of data.

c) **Regression:** According to Morris Hamburg-" The term 'regression analysis' refers to the methods by which estimates are made of the values of a variable from a knowledge of the values of one or more other variables and to the measurement of the errors involved in this estimation process." Sir Francis Galton introduced this term in 1822-1911.Regression shows the nature of relationship between dependent and independent variables. Regression helps to estimate the dependent variable. Regression is two type Linear and Non Linear Regression. When the Regression line is straight line then it is called Llinear Regression and when the Regression line is not straight then it is called Non Linear Regression. Now the regression line is the estimation of existing relationship between two variables. For Two variables(x and y) we shall have two regression line. One for y on x that means value of y when x is given and another one is x on y that means value of x when y is given.

Formula:

To find value of y when x is given (y on x) regression line-

$X-\bar{X}=b_{yx}(Y-\bar{Y})$

Where, $b_{yx}=\frac{n\sum xy-\sum x\sum y}{n\sum x2-(\sum x)2}$

To find value of x when y is given

$y-\bar{y}=b_{xy}(x-\bar{x})$

Where, $b_{xy}=\frac{n\sum xy-\sum x\sum y}{n\sum y2-(\sum y)2}$

How to calculate:

1. Find the mean of two variables.
2. Square each variables.
3. Find summation of two variables separately and summation of square of two variables separately.
4. Multiply both variables and find summation of this.
5. Put all the values in the formula.

When to use:

1) When the researcher wants to predict the value of continuous dependent variable(x) from independent variables.
2) When the researcher want measure the average relationship between two variables.
3) To find the nature of relationship between two variables.

d) Correlation: Correlation analysis the relationship between two variables.YaLun Chou describes that Correlation analysis attempts to determine the 'degree of relationship' between variables. Correlation is measured with the correlation coefficient(r). Correlation is two types a)Positive and Negative Correlation and b) Linear and Non Linear correlation. When values of two variables increase or decrease in a same direction then it is called Positive Correlation. On the Contrary when the values of two variables increase or decrease in opposite direction it is said Negative Correlation. Again Two variables would be said linear correlation if the unit change

between each variable is uniform or constant and Non Linear Correlation is opposite of it.

Formula : Karl pearson's Product Moment method-

$$\text{Correlation Coefficient (r)} = \frac{Cov(x,y)}{\sigma x \sigma y}$$

$$\text{Where, Cov} = \frac{\sum(x-\bar{x})(y-\bar{y})}{n},$$

$$\sigma_x = \sqrt{\frac{\sum(x-\bar{x})}{n}}, \text{ and } \sigma_y = \sqrt{\frac{\sum(y-\bar{y})}{n}}$$

$$\text{we can also write as } r = \frac{n\sum xy - \sum x \sum y}{\sqrt{n\sum x2 - (\sum x)2}\ \sqrt{n\sum y2 - (\sum y)2}}$$

range of correlation lies between -1 to 1.

when r = 0 there is no correlation

How to calculate:

1. Find the number of pair of observations(n).
2. Find the summation of two variables separately.
3. Find the square of two variables separately and their summation.
4. Multiply the two variables and find its summation.
5. Put all the values in the formula.

When to use:

1) When the researcher wants to find the direction and degree of his/her data.
2) To find how much one variable changes when the other one does.
3) When the researcher wants to find how much strong or weak relationship the two variables contain.

e) T Test: It is a hypothetical test that is used to compare the means of two variables. In T test two samples were independent of each other. It was developed by William Gosset in 1908. T- Test is small sample test to determine if there is a significant difference between means of two groups.

Formula : when there is single mean.

$$t = \frac{|\bar{x}-\mu|}{s/\sqrt{n}},$$

where 5- mean population, n- number of observation, s – standard deviation, s^2 – variance.

$$s^2 = \frac{\sum(x-\bar{x})2}{n-1} \quad \text{or} \quad s = \sqrt{\frac{\sum(x-\bar{x})2}{n-1}}$$

How to calculate:

1. We have to find the mean of sample and mean of population.
2. Then have to deduct population mean from sample mean.
3. Then square the deduction value and find the summation of it.
4. We have to find out the variance.
5. Divide the significance of mean by the root of no of observation.
6. Put the all values in the formula.

Formula 2: when there is two sample means-

$$t = \frac{\bar{x}-\bar{y}}{s\times\sqrt{\frac{1}{n1}+\frac{1}{n2}}},$$ where $\bar{x}$ is mean of x variables and $\bar{y}$ is mean of y variables, n_1 is numver of observation of x variables and n_2 is number of observation of y variables.

When to use:

1) When the researcher wants to compare mean of two variables or two data set.
2) When the size of sample is less than 30. (n<30)
3) Degree of freedom is (v = n-1)
4) When researcher wants test significance of regression coefficient in regression model.
5) It is only applicable when the samples are random and independent of each other.

f) Chi- square test: It is a test to determine a significant association between two categorical variables from a single population. In simple

way it helps to differentiate between observed value and expected value. Chi square is also called the test of goodness of fit because it enables us to know how appropriately the theoretical distribution is.
Formula:

$\chi^2 = \sum \frac{(O-E)2}{E}$, where O is observes value and E is expected value.

How to calculate:
1. Compute the deviation between observed value and expected value from each frequency'
2. Square those values and divide it by expected value.
3. Find the summation of value obtained.

When to use:
1) When the researcher wants to find out the difference between observed and expected frequency.
2) It ia applicable when the no of observation is large. (n>50)
3) It is applicable when the researcher wants to find the distribution of the data.
4) It is applicable to find out the independence of data.

g) ANOVA: Analysis of variance or ANOVA is a test to identify whether more than two population are different from each other or not. ANOVA is created by Ronald Fisher, that's why this test is also called Fisher analysis of variance. If there is no difference between the groups or population then ANOVA coefficient (F) will be close to 1. There are two types of ANOVA, i.e. One way ANOVA and two way ANOVA.
Formula:

$$F = \frac{Mean\ sum\ of\ squares\ due\ to\ treatment}{mean\ sum\ of\ squares\ due\ to\ error}$$

Where, F is ANOVA coefficient.
How to calculate:
1. Find the mean of each group.
2. Calculate the overall mean of combined groups.
3. Find variation from mean of each group.

4. Calculate overall variation from the mean of combined groups.
5. Calculate the F ration.

Where to use:
1) When there is normal distribution.
2) When there is continuous data that means more than two populations.

Why these statistical methods are widely used:
We always want efficient, reliable, simplified and easy methods to calculate our data to achieve our research objectives or goals. The reasons why we use those methods so frequently are given below:
merits of Mean:
1) It is the simplest method to compute and understand the average.
2) Every value of the series or data is included in mean.
3) It is reliable and rigid.
4) It calculates the centre value not based on the position or frequency.
5) The mean provides the characteristics of value, that means where the value lies.

Merits of standard deviation:
1) Standard deviation measure how much the data is scattered from the mean.
2) It gives idea about how the data is distributed.
3) Standard deviation is mostly used for further work.
4) From the standard deviation we can find variance and coefficient of variation.
5) It is rigidly defined and based on all observation.

Merits of regression:
1) Regression is method to predict one variable from another value.
2) It helps in correcting errors.
3) It helps in business decisions.
4) Works o any size of dataset.
5) Accurate and easily adaptable.

6) Non biased.

Merits of correlation:

1) It is a easy method to find direction and degree between two variables.
2) It helps to measure the strength of relationship between two variables.

Merit of t- test:

1) It helps in comparing mean of two variables.
2) One sample test is helpful to measure whether a sample value significantly differs from a hypothesized value.

Merits of Chi square test:

1) It helps to measure the distribution of data.
2) It helps in association between two variables.
3) It helps in measure of difference between observed and expected value.
4) Easy to compute and interpret.
5) It can be used for large number of sample.

Merits of ANOVA:

1) It helps to signify whether the more than two populations have same mean or not.
2) It can control over all type I error rate.
(Sources: https://clinfowiki.org)

Conclusion:

There are so many statistical methods to use in research. To conduct any research we have to plan and statistics is included in that plan how to collect data and analyse it. It helps to provide accurate result from different calculation. It effects the decisions of researcher. It describes your data in simplest form by measuring relationship, making comparisons. Though, the statistics have so many advantages but there is still misuse or disadvantages of it. The researcher should have proper knowledge about what statistical method should use for which research. Otherwise, it would become complicated for researcher to reach its goal. The most important initial thing is to identify the population and should collect only necessary data. Inaccurate data collection can ruin the research. In a simple way statistics is like a wheel for research and it need proper attention and design to proceed.

Bibliography:

1. Action Research by Dr Mukul Saikia. Edition 2020.
2. 6. "Chi- square test" by Ecoholics- Lrgest platform for Economics- https://youtu.be/ROEqFAL4YnQ
3. Gupta. S.C. Fundametals of statistics – first edition 1981, Himalaya Publishing House PVT. LTD.
4. "Measurement of correlation coefficient" by Aryan college – https://youtu.be/4sD_□ ZRyFnBw.
5. "Regression analysis statistics"-By prof. Evneet's commerce class- https://youtube.be/ctpPPZZ6u0M
6. "Statistical method"-S.P. Gupta first edition 1969, published by Sultan Chand & Sons
7. "TYPES OF RESEARCH METHODOLOGY" BY PRIYA PEDAMKAR.
8. "the advantages of regression analysis and forecasting- www.bizfluent.com
9. "Why you need to use statistics in your research" www.statistics.laerd.com
10. what is analysis of variance (ANOVA) & how to calculate"- https://gocardless.com .

Research paper writing and its principles

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Abstract

Research is a movement from the known to unknown. A research paper is a piece of an academic writing that provides analysis, interpretation and argument based on in depth independent research. Writing a research paper requires to a strong knowledge of topic, engages with a variety of sources and makes an original contribution to the debate. The quality of the research paper depends upon the characteristics of the researcher. Research paper, only purpose is to provide information. Research papers should report the results of original research. There are different types of research papers of which experimental research paper describes a particular experiment in detail. It is common in fields like biology, chemistry or physics. There are different types/ groups of journal in India of which only UGC-CARE list Journals were considered as quality Journals in India. Before submit ion of a manuscript/ research paper to a Journal, researcher should check the name of the Journal, subject, area of the Journal, author guidelines etc., Journal will be publishes only original research paper. The format of the scientific research paper writing are preliminary section includes- Title of paper, Author names, Author affiliation, Abstract, Keywords; bodypart-Introduction,Material and Methods, Results, Discussion, Acknowledgements and reference materials. Completion of research paper writing, researcher should run the paper through plagiarism checker. It is a useful tool for writers

in any field who want to create fresh, original, plagiarism free work. This paper throws light on various steps of research paper and their importance in scientific research paper writing.

Keywords:
Research paper; title; abstract; introduction; results; acknowledgements.

Introduction:

A Research paper is a piece of academic writing that provides analysis, interpretation, and argument based on in-depth independent research.Research papers are similar to academic essays, but they are usually longer and more detailed assignments, designed to assess not only our writing skills but also our skills in scholarly research. Writing a research paper requires us to demonstrate a strong knowledge of our topic, engage with a variety of sources, and make an original contribution to the debate.The research paper introduction should address three questions: What, why, and how? After finishing the introduction, the reader should know what the paper is about, why it is worth reading, and how we will build our arguments.

Be specific about the topic of the paper, introduce the background, and define key terms or concepts.

This is the most important, but also the most difficult, part of the introduction. Try to provide brief answers to the following questions: What new material or insight are we offering? What important issues does our essay help define or answer?

To let the reader know what to expect from the rest of the paper, the introduction should include a "map" of what will be discussed, briefly presenting the key elements of the paper in chronological order.

Principles:

A research paper is an important document that's why you need to be very careful while writing it. There are many basic principles that one should take to make sure that the paper is impressive.

Wisely Choose Topic:

First of all, select the area of study after that find a topic which we

have command over so that we can get relevant data easily. Make sure that our topic is not very broad or generic so that we can include the most relevant data in our report.

Motivate Ourselves:

Writing a thesis requires a lot of time and effort, that's why many students find themselves felt boredom in the research. But if we have encouraged to find a solution that motivates us in the whole process. Although, motivation is the key to writing a good thesis, and this encouragement ends our report with great acknowledgment.

Well Structured:

Our research paper should be well structured and well written in order to get published. Don't overwrite just try to make our data as concise as possible. Don't forget to mention the well-structured research paper statements that may accept or reject our whole research paper work. This will be beneficial for us and it will keep the readers hooked to our report. A bug report is unable to hold the reader's attention for a longer period.

Determination & Patience:

Start the report with determination to have an incredible piece of academic writing. Try to get help from as many sources as we can to complete our paper on time and with ease. Patience is another important tool that one might require while writing a paper, even if we face writer's block, don't lose hope and keep going till it's not completed.

Make a Schedule:

Once we have completed the prerequisites to write the paper, form a schedule that we can follow easily and regularly. Once we have made the schedule try to stick to it.

Review other Research:

The literature review is an important part of any research paper

that's why we have to read as thoroughly as possible within a given time limit. Brush up on our researching techniques before starting on the report, like skimming will be really helpful while carrying out a literature review.

Add References:

A research paper should be duplication free so even if we are using others' work make sure that we give proper references and mention all the sources which we used for our research at the end of the report. This will make our work more authentic and we will be giving recognition to other writers too. Don't make a big deal out of our paper, many students write such reports all across the globe each year.

Another useful tip is that the author should keep writing even when he or she is carrying out the research, this will help to create a flow for us and we won't have to keep the writing for last.

Writing Process

Writing is a time-consuming process and if we want to write with creativity then it takes much time. Writing is not just to mention the ideas or facts but also organize those ideas in a refined way and then focuses on revising and reviewing. It is necessary for the instructors to let the students aware of the elements of writing because during their assignments or project they don't know how to start and finish. By knowing these tactics it enables them to complete assignments in an effective way.

Components of Writing Process:

There are some smart writing tips for students/writers to complete their writing tasks in less time but with efficiency. These three elements are the source of good and worthwhile writing, and also the source of creativity. Following are the guidelines which one needs to follow while writing the articles/assignments and paper:

Invention

Before making the first draft the students/writers need to analyse the audience because this is the most important factor as the audience reads what they want. The writer should know their level of understanding and expectations. The purpose and audience two important factors that could not be avoided by the writer. Initially, the writer should generate different ideas and note down all of them and this exercise is also called brainstorming. The writer gathers all the material related to the topic in the invention stage to improve the facts and the figures.

Composing

After performing the invention strategy the writer should do the composing. The writer should organize ideas in an effective manner means defining our writing style to attract the audience. Here the organization of ideas is very essential; manage the whole points in different chapters and paragraphs. We should define the statement of the paper and then narrow down the topic in different areas. The arguments should be organized in such a way that they will clearly support the claim. In the conclusion, the main points should be repeated and at last, must add some recommendations so that the reader understands our opinion.

Revision

The revision of the first draft is very necessary because the documents with unrelated phrases and mistakes in the document make a negative impact on the reader. He wants a reliable document with proficiency and creativity. While revising and proofreading the writer can check the spelling mistakes,paragraph transitions, and punctuation and grammatical errors. The sentence structure is again very important to review. It is not always necessary that the writer have to cut the material sometimes he/she has to add the material too because of insufficient arguments.

If the audience finds mistakes within the document he will convert to another platform so missing one of the elements makes the document useless. Writing is not difficult to do but the hard reality is that the writer needs to follow the guidelines mentioned above in order to achieve the purpose of writing.

Conclusion:

The research paper conclusion is designed to help our reader out of the paper's argument, giving them a sense of finality.Trace the course of the paper, emphasizing how it all comes together to prove our research paper statement. Give the paper a sense of finality by making sure the reader understands how we have settled the issues raised in the introduction. We might also discuss the more general consequences of the argument, outline what the paper offers to future students of the topic, and suggest any questions the paper's argument raises but cannot or does not try to answer.

References:

1. www.wr1ter.com
2. www.duplichecker.com
3. www.research.com
4. www.scribbr.com
5. www.researchgate.net

The Rules For the Use of Footnotes In a Research: A Discussion

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Abstract

A research activity is a serious and systematic study of a subject. Research is an investigation to a problem on a special subject. Problem' here means that the already acquired data information and conclusions have not provided a complete details of the subject. So in order to arrive at a specific conclusion giving complete details, the researcher has to investigate the topic or subject searching for more information and collecting more samples.

Strictly related to research, one of the most important part of a research paper is the use of footnotes. Whenever one needs supportive data, validity, source or explanatory notes in a research, the footnotes must be added and displayed at the bottom of a page. In the current usage in research methodology, footnotes used in a research paper can be displayed very close to the sentences or paragraphs instead of displaying them on the bottom of the pages. In that case, the title of the author, publication year, page numbers are to be mentioned close to the idea or brief notes.

Key Word: Research, Methodology, Foot-Note, Knowledge, Investigation

Introduction:

In general, the meaning of 'research' is to find out or investigate information. The word 'research' at first meant re-investigation of

something. Later, it came to mean careful inquiry or a methodological search for increasing knowledge. The Advance Learner's Dictionary says it is 'a careful investigation or inquiry specially designed or search for new facts in any branch of knowledge." Thus, it can be said that the aim of research is to try to search for new knowledge in a methodological way. In his book 'Introduction to Research' Tyrus Hilway says the aim of researchers is to solve a particular problem.

In it simplest form the aim of research is careful selection of a subject with a design and purpose and to seek for sources of information primarily and then analysing the data collected from those sources. So, research activities are some hard labours of scientific inquiry in the field of knowledge.

Research is a high level fundamental activity .The research centred around a definite subject or topic should not be influenced by any philosophy, viewpoints or isms. It must be done with a serious and systematic but impartial pursuit and must have methodological approach.

Purposes of Research:

The purpose of any research is to find answer to the questions arising out from the selected topics or subject in a scientific way. The trying to give answers by investigating is the sole purpose of a research project. Actually, research aims at providing the hidden truth or truth which has not been discovered yet. The main aim of research is, therefore, the finding out of the truth and by this imparting new knowledge, information and conclusions. Moreover, evaluating a new subject or topic with newer views is also another aspect of research. It must also aim at reforming the society with new ideas.

The Necessity of Footnotes and Their Uses:

In a research, the most important thing is the use of 'Footnotes'. The footnotes used in research provides the reader with the sources of data collected and offers authenticity to the solved hypothesis thereby giving the reader no space for being confused .It any topic or

print in the research needs support, authority, source witness or explanatory notes ,then the researchers should mention them bottom of the pages .In it's real sense a footnote is called 'footnotes' as it is at the bottom of the page.

Footnotes, however', must not be used for universal truth or knowledge. It must not be used when it is not necessary. While using foot notes, the following necessary things must be given an eye –

I. To show the source of information.
ii. To bring in authenticity to an argument.
iii. To re-direct to an opinion or decision made by a specialist.
iv. To deny some earlier writers or their ideas or arguments.
v. To point out the source of direct or indirect quotes.
vi. To include necessary data of the source of information for further reading by the readers. However, there is no need of footnotes while giving a summary or shorter version of a book.

Footnotes are used in three ways –

1. At the bottom of the page.
2. At the end of every chapter.
3. At the end of a book but chapter wise.

Actually, the notes used at the bottom of a page should only be called as 'Footnotes'.

A research journal or thesis is prepared with the help of various books, magazines essays, dessertations, treatises, data-information etc. Whenever, another book is to be referred in some context or analysis, there must be a mention of that particular book .This enables the readers to have an idea about those books or helps them to find out those helping materials.

Rules for Using Footnotes:

The only purpose of using footnotes is to point out the sources of the used data .By this the validity of the information, the brief explanation of the topics or establishment of an opinion or decision

making are made easily possible. Therefore, the included data should be errorless and complete. The following things are to be considered while doing this:

1. When a book is mentioned for the first time, the following information should be provided-,
   a. full name of the writer
   b. the name of the book after putting a comma(,)
   c. page no of the book
2. While putting the name of the book, the title should not be written beforehand. Moreover, except for writers who use abbreviations for his name ,no short names should be used.
   (Marjorie Boulton, **Anatomy of Prose,** Page- 20)
3. The names of books or megazines should be put in italics so that it easily captures the eyes of the readers.
4. If the real name of an author is missing or pseudo-name is used by him ,and if his identity is known ,the name should be put in brackets, for example: Kripabar Barbaruah (Lakhsimnath Bezbaruah) Kakotor Topola, Page- 30
5. If there are names of three authors in a single book all the names should be put in the notes but after the name of the first author a comma should be used ,and then a conjunction like 'and' should be used to mention the rest of the authors names.
6. When more than three authors' name should be put ,just putting the first author's name is enough but the rest of them should be mentioned as 'others'.
7. In case of edited books by a single author, after the author and book's tittle,the name of the booka and the editor also should be put respectively.
   For example- Lakhsimnath Bezbaruah, **MorJiwan Xuoron, Bezbaruah Granthawali** (ed). Atul Chandra Hazarika.
8. If any essay from an edited book or megazine should be mentioned, at first the name of main author and then within inverted commas, the name of the essay or treatises should be

mentioned.Afterthat the main book and the name of the editor-author should be put.

For example:

Basanta Kr.Bhattacharya," **Prasin Bharatar Bhakha Sorchar Itibritto", Bhakhar Totwakotha** (ed). Nahendra Padun, page-25

It is worth mentioning here that when a book or essay has to be mentioned several times, the name of the book and the author should not be mentioned again and again. All one has to do is writing 'Ibid' and page numbers of the footnotes used previously. For example:

1. M.Sarma : **Research Methodology** P- 35
2. Ibid page:

Also when a book or essay is to be mentioned again after another reference book, in that case write the name of the author and write Ibid and page numbers –

Example:

1. A Berret**, A Study of Modern Drama**, Page- 36
2. Marjorie Boulton, **Anatomy of Prose**, Page- 37
3. A Berret ,Ibid Page- 38

If the writer is same but the book is different, this rule doesn't apply at all.

In the present times, most of the people involved with research activities, academically and formally, take help of the **MLA Handbook** for the preparation of footnotes. A book is written to clearly reveal the facts with arguments .For this footnotes should be widely used \. According to **MLA Handbook**, the footnotes can also be placed immediately after the citation ends. The name of the author, the tittle of the book, page numbers are to be written besides the citation itself. It is not always necessary to numbering the foot notes used. So, it has become an easy task to use footnotes for a researcher now , just he needs to remember one thing i.e there must be uniformity of the style he uses for his footnotes, so that readers do not falter anywhere. There should also not be any repetition. No academically written tittle of an author should be used either.

Conclusion:

The aim of a research or journal is discovery of new theory and present a conclusion on the subject selected. In this connection, whatever scientific method he uses ,the first step he must follow is data collection, acute observation of the data and source as well as preparing himself for a realisation of the data collected with deep concentration. All researchers must go through these steps like data collection, observation of the data, realisation or analysis of the data and presenting his conclusion. In this journey, the use of foot notes are very important aspect for establishing validity of the arguments or presenting his own viewpoint. But sometimes, there search papers become full of citations making refferences to various scholars during his analysis and discussion. That must not happen, only the truth establishment should be given priority. A researcher can prepare a good research paper only when the data are presented with valid arguments and real facts for authenticity.

Foot note:

1. A.S Hornby (ed): Oxford Advanced Learner's Dictionary, P-718

Bibliography:

Hillway, Tyrus. "An Introduction to Research". Houghton Mifflin.1956

Hornby, A.S (ed). "Oxford Advanced Learner's Dictionary of current English". Delhi. 8th edition. 1985

Kalita Ranjan (ed). "Govesokor Haatputhi". Bandhav.Guwahati 2nd edition. 2017

Modern Language Association. "MLA Hand book for writers of Research

paper". Seventh Edition. East-West Press PvtLtd. New Delhi. 2009

Saikiya Nagen. "Govesana paddhati Paricay". Bananlata. Guwahati. 1st edition. 1996

Sarma, M. "Research Methodol ogy". EBH Publishers. Ghy.2010

Application of Biostatistics in Research Methodology

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Abstract

Biostatistics in research methodology is one of the key makers of hypothetical assumption.This technical instrumentensures modernized of research knowledge in more scientific way. Statistics is the science of conducting studies to collect data, organize the data, summarizeand analyze the data to draw conclusion. Biostatisticsconstitute a wide range of topics in research. The prime applications of biostatistics are reported in health, nutrition, environment, ecology, economic biology, population genetics and in biological sequence analyses. The study highlights the common application of biostatics in bioscience to make more convenient of any kind of researches activities. The researchers may determine their thinking processes and reflect the outcome at a glance which could be able to visualized and guided independently. The descriptive and inferential statistics are the way of investigators during research to achieve their goal. Biostatistics itself reconstruct the superior entity into controllable and applicable correctly.

Key words: Biostatistics, Application, Research Methodology and Scope

Introduction

Biostatistics is the key tool to arrange raw data of any kind of research in a meaningful with standard assumption. Statistics is the science concerned with developing and studying methods for collect-

ing, analysing, interpreting and presenting empirical data. The history of statistics reported that in 1791 Sir John Sinclair introduced the term 'statistics' into English in his Statistical Accounts of Scotland. The word statistics was first used by a German scholar Gottfried Achenwall in the middle of the 18th century as the science of statecraft concerning the collection and use of data by the state.Muhammad Imdad Ullah (2020) reported that according to pioneer statistician Yule, the word statistics occurred at the earliest in the book "the element of universal erudition" by Baron (1770). In 1787 a wider definition used by E.A.W. Zimmermann in "A Political survey of the present state of Europe". It appeared in the encyclopaedia of Britannica in 1797 and was used by Sir John Sinclair in Britain in a series of volumes published between 1791 and 1799 giving a statistical account of Scotland. In the 19th century, the word statistics acquired a wider meaning covering numerical data of almost any subject whatever and also interpretation of data through appropriate analysis.Statistics may be said to have its origin in census counts taken thousands of years ago; as a distinct scientific discipline, however, it was developed in the early 19th century as the study of populations, economies, and moral actions and later in that century as the mathematical tool for analysing such numbers. Along with Karl Pearson, Ronald A. Fisher is considered a pioneer of modern statistics. In addition to his ground breaking statistical design work, Fisher argued for the concept of randomization in experimental design in his 1925 book, Statistical Methods for Research Workers. Prof. Prasanta Chandra Mahala Nobis is also known as the father of Indian Statistics, who contributed a lot in the use of statistics in research.

Some statistical methods are applied in different ways in research such as planning, designing, collecting data, analysing, drawing meaningful interpretation and reporting of the research findings. In fact, statistical methods dominate the scientific research as they include planning, designing, collecting data, analysing, drawing meaningful interpretation and reporting of research findings. The statistical analysis makes the data logically appropriate and more scientific during research or in project works. It is extensivelyused in marketing, e-commerce, banking, finance, human resource, production and information technology. Some powerful techniques like index numbers, time series analysis, forecasting etc. are immensely useful in the analysis of data in economic planningand in framing planning models.In research methodology, the branches of mathematics are dealing with gathering, analysing and making inferences from data particularly census data applicable in all the disciplines. The uses of statistics are constituted the branches like weatherforecast, emergencypreparedness, sport, education,psychology, socialscience, predictingdisease and government associated plan program.Statistics helps inprocessing of raw data quantitatively and numerically toexpresses certain assumption.Expertsare using applied statistics in numerous of industries including business, marketing, media, finance, insurance, government, healthcare, manufacturing and engineering.

Objectives

The study is to analysis the application of biostatistics in research methodology and its scope.

Methodology

The data is used from e-resources and made a comparative analysis to highlight the application of statistics in research methodology and portraited its indication with examples. Statistical research method is applied here in Descriptive Analysis, Inferential Analysis, Predictive Analysis, Prescriptive Analysis, Exploratory Data Analysis, Casual Analysis and Mechanistic Analysis.

Results and Discussion

Statistics can be defined and make better understanding by the following statements-

- Statistics are aggregate of facts.
- Statistics must be numerically expressed.
- Statistics are collected for a pre-defined purpose

- Statistics should be collected in a systematic manner.
- Statistics are placed in relation to each other.
- Statistics is a mathematical tool that is used to collect and summarize data

More examples of statistical application could be given here for better understanding of its scope. The top six application of statistics are-

- Research Interpretations and Conclusions
- Meta-Analysis of Literature Reviews
- Clinical Trial Design
- Designing Surveys
- Epidemiological Studies
- Statistical Modelling

Application of statistics in Mathematic science are-

- Descriptive Statistics. In this type of statistics, the data is summarised through the given observations.
- Inferential Statistics. This type of statistics is used to interpret the meaning of Descriptive statistics.

The advantages of statistics are-

- The bulk data can be presented in a precise and definite form.
- The comparison and conclusions of data becomes easy.
- It provides the exact description and a better understanding.
- It helps in designing the effective and proper planning of the statistical inquiry in any field.
- It gives valid inferences with the reliability measures about the population parameters from the sample data.

Statistics can use in various sectors like psychology, sociology, probability, geology, weather forecasting etc. to obtain understanding from data and hence it regards as mathematical science.

Statistics are used in biology, physics, chemistry, meteorology, sociology, communication and even information technology for data collection, data analysis and finally coming up with a hypothesis testing.

- Quantitative analysis involves the quantifying of data with the help of some form of statistical analysis.
- Quantitative analysis generally involves statistical techniques like significance testing, regression analysis, multivariate analysis, etc.
- Statistics Solutions is the country's leader in quantitative analysis.

Scope of Statistics

- It presents the facts in numerical figures. For example, recording the sales of various products in a company.
- It studies relationship between two or more phenomena.

Statistical tools in qualitative research-

- A statistical tool helps researchers and marketers organise quantitative data gathered from experiments, focus groups, interviews, questionnaires etc.
- Some of the most common and convenient statistical tools to quantify such comparisons are the F-test, the t-tests, and regression analysis.

In academic performance, statistics helps in the individual comparison of students differing in respect of their ages, abilities and intelligence levels which represents students' achievement in one particular subject. Statistical knowledge definitely helps researchersthe use of proper methods to collect the data, correct analyses and effective presentation of theirconsequences. Biostatistics play a vitalrole inthe discoveries of data-based predictions in research.Biostatistics is also known as biometry. Biostatistics are the development and application of statistical methods to a wide range of topics in biology. It encom-

passes the design of biological experiments, the collection and analysis of data from those experiments and the interpretation of the results. Statistics is like a bridge between information and knowledge with justification.

There are two kinds of statistics which are descriptive statistics and inferential statistics. In descriptive statistics, the data or collection data are described in a summarized way using indexes such as mean and median, graphwhereas in inferential statistics, can use of it in order to explain the descriptive kind which draw conclusions from datausing statistical tests such as student's t-test and make predictions to test hypotheses of data. Both of them are used on a large scale.

The most commonstatistical tools are the mean, the arithmetical average of numbers, median and mode, range, dispersion, standard deviation, inter quartile range, coefficient of variation, etc. There are also software packages like SAS and SPSS which are useful in interpreting the results for large sample size.ANOVA, which stands for Analysis of Variance, is a statistical test used to analyse the difference between the means of more than two groups. A one-way ANOVA uses one independent variable, while a two-way ANOVA uses two independent variables. ANOVA in SPSS, is used for examining the differences in the mean values of the dependent variable associated with the effect of the controlled independent variables, after taking into account the influence of the uncontrolled independent variables. Econometrics stands statistical analysis of economic data. For example, statistical study of populations known as demography.According to e-resources,statistics allow psychologists to present data in ways that are easier to comprehend. Visual displays such as graphs, pie charts, frequency distributions, and scatterplots allow researchers to get a better overview of data.

There are many more problems with statistics, including bad sampling and choosing the wrong method of survey or interview. If you are commissioning market research, be sure to choose a company that understands the principles of basic statistical analysis and good survey design.

A t test is a statistical test that is used to compare the means of two groups. It is often used in hypothesis testing to determine whether a process or treatment actually has an effect on the population of interest, or whether two groups are different from one another. Similarly, z -tests are the statistical way of testing a hypothesis, when the known population variance ó2. It can be used to compare the sample mean ì to the population mean ì0. However, if the sample size is large, ne"30 n e" 30, then it can still use z -tests without knowing the population variance.

A z-statistic, or z-score, is a number representing the result from the z-test. Z-tests are closely related to t-tests, but t-tests are best performed when an experiment has a small sample size. Z-tests assume the standard deviation is known, while t-tests assume it is unknown. The p value, or probability value, tells you how likely it is that your data could have occurred under the null hypothesis. It does this by calculating the likelihood of your test statistic, which is the number calculated by a statistical test using your data. Take the sample mean, subtract the hypothesized mean, and divide by the standard error of the mean. Take one sample mean, subtract the other, and divide by the pooled standard deviation. A critical value is the value of the test statistic which defines the upper and lower bounds of a confidence interval, or which defines the threshold of statistical significance in a statistical test.

Confidence intervals are one way to represent how "good" an estimate is; the larger a 90% confidence interval for a particular estimate, the more caution is required when using the estimate. Confidence intervals are an important reminder of the limitations of the estimates.

In statistics, a two-tailed test is a method in which the critical area of a distribution is two-sided and tests whether a sample is greater or less than a range of values. It is used in null-hypothesis testing and testing for statistical significance.

- Step 1: State your null and alternate hypothesis
- Step 2: Collect data

- Step 3: Perform a statistical test
- Step 4: Decide whether to reject or fail to reject your null hypothesis
- Step 5: Present your findings

A hypothesis is an assumption made before any research has been done. It is formed so that it can be tested to see if it might be true. A theory is a principle formed to explain the things already shown in data. That belief is called the researcher s assumption. Following that assumption then the researcher predicts what the effect is going to be like based on the researcher s knowledge before starting the research. This prediction is called hypothesis. In hypothesis testing there are two mutually exclusive hypotheses; the Null Hypothesis (H0) and the Alternative Hypothesis (H1). One of these is the claim to be tested and based on the sampling results (which infers a similar measurement in the population), the claim will either be supported or not

Seven Step Process of Statistical Hypothesis Testing

- Step 1: State the Null Hypothesis
- Step 2: State the Alternative Hypothesis
- Step 3: Set
- Step 4: Collect Data
- Step 5: Calculate a test statistic
- Step 6: Construct Acceptance / Rejection regions
- Step 7: Based on steps 5 and 6, draw a conclusion about

The two types of hypotheses are null and alternative hypotheses. Null hypotheses are used to test the claim that "there is no difference between two groups of data". Alternative hypotheses test the claim that "there is a difference between two data groups".Always write the alternative hypothesis, typically denoted with H_a or H_1, using less than,

greater than, or not equals symbols, i.e., (`", >, or <). A decision rule is the rule based on which the null hypothesis is rejected or not rejected. We first state the hypothesis. Then we determine if it is a one-tailed or a two tailed test. We then specify a significance level, and calculate the test statistic. To justify whether it is a one-tailed or a two-tailed test, it depends on the original claim in the question. A one-tailed test looks for an "increase" or "decrease" in the parameter whereas a two-tailed test looks for a "change" (could be increase or decrease) in the parameter.

A variable in research simply refers to a person, place, thing, or phenomenon that you are trying to measure in some way. The best way to understand the difference between a dependent and independent variable is that the meaning of each is implied by what the words tell us about the variable you are using.There are different types of variables and having their influence differently in a study viz. independent & dependent variables, active and attribute variables, continuous, discrete and categorical variable, extraneous variables and demographic variable. Nominal data is data that can be labelled or classified into mutually exclusive categories within a variable. These categories cannot be ordered in a meaningful way. For example, for the nominal variable of preferred mode of transportation, you may have the categories of car, bus, train, tram or bicycle. The unit of measurement usually given when talking about statistical significance is the standard deviation, expressed with the lowercase Greek letter sigma (ó). The term refers to the amount of variability in a given set of data: whether the data points are all clustered together, or very spread out. In medical education research studies that compare different educational interventions, effect size is the magnitude of the difference between groups. The absolute effect size is the difference between the average, or mean, outcomes in two different intervention groups.

Conclusion

The application of biostatistics in research methodology plays a significant role in solving problems and act as a structured approach method to solve any researchfindings. Now a days, biostatistics intro-

duce in course curriculum at undergraduate or postgraduate level to understand statistical application extensively. It may further develop in higher education where statistical application constitutes the research entity including commercial purp

References

Context: A set of research methods and techniques applied to a particular field of study (Statistics Canada, "Statistics: Power from data", Glossary, available at: http://www.statcan.ca/english/edu/power/glossary/gloss.htm).

Gottfried Achenwall (20 October 1719 – 1 May 1772) was a German philosopher, historian, economist, jurist and statistician, available at:
https://en.wikipedia.org/wiki/Gottfried_Achenwall

Karl Pearson and R. A. Fisher on Statistical Tests: A 1935 Exchange from Nature Author(s): Karl Pearson, R. A. Fisher, Henry F. Inman Source: The American Statistician, Vol. 48, No. 1 (Feb., 1994), pp. 2-11 Published by: American Statistical Association Stable URL: http://www.jstor.org/stable/2685077

Muhammad Imdad Ullah (2020), A short history of Statistics, available at:https://itfeature.com › statistics › a-short-history-of-statistics

Sir John Sinclair (1791-1799), The statistical Account of Scotland, V-21, p.18, E. P. publishing.

Sir John Sinclair (1814), 'The Pyramid of Statistical Enquiry' General Report of the Agricultural State, and Political Circumstances, of Scotland. Vol 3, Edinburgh, Constable, p.13

Statistical Methods for Research Workers. Prof. Prasanta Chandra Mahalanobis, available at:https://en.wikipedia.org/wiki/Prasanta_Chandra_Mahalanobis

Theoretical frame work on Methodology

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Abstract:

To do a research, methodology is very important. It is an essential part of presenting the ones findings of research. It gives the details of research in section which supports the findings of research, it's techniques and also the gives the road maps of reaching the findings. The section that gives the details of the research are- 1. Restate the research problem. 2. Types of research. 3. If any innovative methodology used. 4. Details of collection of data. 5. Method of analyzing data. 6. Justification of the methodology used. 7. Problem faced in research and solutions. 8. Reference. In this paper dark energy and the expansion of the universe has been discussed. Our universe is expanding, it is a ground breaking truth. What is the cause of it? It is a current research topic in astrophysics.

Key words:
Dark energy, red shift, and negative mass.

Objective:

1. How to do research step by step.
2. How to write a research paper.

Methodology:

Empirical methodology has been used. The study is based on secondary sources. Data are collected from different papers, publication, journals etc.

Introduction:

Methodology gives the details of the research and its findings step by step. It is the overall strategy of the research. It is about how a researcher systematically designs a study to achieve the research goal. For example- what will be exact method of approaching research problem, what data to collect, how to proceed to collect related data, sampling process, and how to analyze it. So, it is very crucial and important. A good research methodology provides sound findings.

Our universe is expanding; it is a ground-breaking truth. What is the cause of it? It is a current research topic in astrophysics. So, cause of expansion is the research problem and step-by-step solution of this problem is the methodology. Many scientists think that unseen dark energy is behind the expansion of the universe and some others think it is for supernova expansion for which enormous energy comes out. So. If dark energy is taken, as then one should define this energy, property (force, pressure etc.) of it,should collect data and analyze it to prove that the universe is expanding due to it.

Discussion:

We are part of the mysterious universe. In 1929 Hubble said that the universe is expanding from the observation of redshift of distance stars and the cause behind it is thought to be the unseen dark energy. According to the current popular concordance model of the universe, 68% of the universe is dark energy, 27% dark matter and only 5% normal visible matter. Dark energy is the today's unsolved mysteries of cosmology. It cannot be seen. It acts as Einstein antigravity force, but its origin is unknown. The expansion of the universe is infinite.

As we blow a balloon then it expands i.e. we are pushing.Similarly as the universe is continuously expanding so, there must a force for expansion and this force should be antigravity.

Redshift is that when the source of light moving away proportional to the increase of wavelength i.e shifting to the red end of the spectrum.

Doppler shift, the frequency of coming light can be determined and so the speed of the source as

$f = [c/(c+v_s)]fo$

f is the observed frequency , fo is the actual frequency, c is the velocity of the waves in medium and v_s is the velocity of the source. vs is + when source is moving away from the observer. And – when coming towards the observer. And thus the distance of star or galaxy can be determined by the following formula

$v = hxd$, where h is the hubble constant. v is the recessional velocity. From the collected data scientist determined that the universe is expanding.

There must be an energy which pushing all in our universe

Dark energy is thought as the cause of the expansion of the universe. Energy, $E = mc^2$.

Now, F= ma, i.e force is required for acceleration, so there must be an unseen energy which do not interact with electromagnetic radiation (sun light).

Dark matter gives force on the surroundings and dark energy which is repulsive is the cause of the expanding universe. Negative mass is a exotic matter which spread out the universe. These two may be a part of unified dark fluid with negative mass. Negative mass is hypothetical one, which repel the surroundings

All well understood physical forces can be described through two polarities. Say Electric force - + and – charges, Magnetic force – N- pole and S- pole, quantum information (0,1). So, gravitational charge (said mass) must be with positive and negative. But it is taken only positive value. The understanding of mass is incomplete.

Einstein gave a solution of this with negative masses that is the cause of expanding universe and this mass does not interact with electromagnetic radiation (light). So the mass in the universe gives a new concept – that is the negative mass. The particles may have the positive, zero and negative mass. Negative mass is exotic to us. Now positive mass attract the surrounding masses, so, the negative mass will be repulsive i.e. it will repel all the surrounding masses and so the

expansion of the universe. If a negative mass is pushed then it will come towards the force.

Negative mass is a type of exotic matter whose mass is opposite to the normal. It is repulsive in nature. The real representative of such matter is a region of negative pressure density produced by Casimir effect (Two mirrors in vacuum will attract to each other, is the Casimir effect. It was first predicted by Dutch Physicist Hendrick Casimir in 1948 and Steve K. Lamoreaux , at Los Alamos National Laboratory, measured the force in 1996)

Physicist (Washington State University, April 17,2017) created a fluid with negative mass, which accelerates, in the opposite direction when pushed i.e accelerates backwards.

According to Newton's 2nd law F= ma, and the matter moves in the same direction of the applied force. But with negative mass it will accelerates backward.

Physicist (WSU) Forbes and his colleagues created a condition for negative mass by cooling rubidium atoms what is known as Bose Einstein Condensate , in this state the particles move very slowly and behaves like waves.

The interstellar space is not empty, it is with invisible energy (dark energy) and it is repulsive. According to Einstein energy, $E = mc^2$. E is negative if m is negative as c^2 is always positive.

Dark energy is a hypothetical form of energy with repulsive pressure .as the mass is negative so, the force also negative and so the pressure

Conclusion:

Negative mass cosmology predicts that the Hubble constant vary over time which solves many cosmological crisis. Albert Einstein and Stefan Hawking considered negative masses as it provide answers of many longstanding problems in cosmology. So, the negative mass concept should be given attention.

Reference:

1.https://www.earthsky.org/space/dark-energy.
2.http://.en.m.wikipedia.org-
3. www.sciencedirect.com
4. www.phys.org
5.www.scientificamerican.com
6. www.britnnica.com/science,Type

Referencing in research publication with special reference to APA Style

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Abstract:

Referencing is a method to acknowledge the contribution of another person's work or ideas incorporated into one's work. It is one of the most important aspects of any academic or scientific work and by doing this plagiarism can be avoided. Referencing is done in two steps- citation and bibliography or reference. Citation is the in-text references i.e. the part of the text within the one's writing in the form of a direct quote, paraphrasing the essential element of someone else's idea in brief notation. Citation is not required in case of unpublished own idea and if the information is common knowledge. There are three major citation styles used in academic writing are- American Psychological Association (APA) style is mainly followed in the fields of Science, Social Science, Education, Engineering, etc. Modern Language Association (MLA) style is mainly followed in the field of Humanities and Chicago style in Humanities, History, Natural Science, etc. Harvard Style of referencing is used mostly in Australia and U.K. In APA style, in-text citations usually appear as parenthetical notes with the author's surname and year of publication. For more than two authors, et al. will be included after the surname of the first author. For every in-text citation, there must be a corresponding entry in the reference list at the end of the document on a new page. The list of references will be in alphabetical order by name of the first author. Reference should contain the author's surname, initial(s), year of publication, Article title, Journal title, volume number, issue number, and page number. In the case of e-journal or e-book etc., the inclusion of DOI or URL is preferable. There are lots of tools that can help to manage and format citation correctly like Google Scholar, Library Search, etc. Mendeley, Zotero, and EndNote are some of the software used for managing references.

Keywords: acknowledgement, DOI, in- text citation, reference style, reference managing tools.

Introduction:

Referencing is a method to acknowledge the contribution of another person's work or ideas incorporated into one's work. It now becomes an integral part of any academic writing. Nearly all research builds on previous research. Researchers generally start a project by studying past works in the field of their interest for getting ideas and information from those works. In this practice, researchers should have acknowledged the previous works or sources of their ideas, methodologies, or data source in their write-ups. It is one of the most important aspects of any academic or scientific work and by doing this plagiarism can be avoided. It also helps the writer to establish his/her findings depending on the findings of previous works. Through this documentation, writers describe key features of each source such as authorship, as well as publication details. The history of referencing was started by the pioneering work of Edward Laurens Mark, an American Zoologist and Director of the Zoological Laboratory of the Museum of Comparative Zoology at Harvard University. In 1881, Mark wrote a paper on the embryogenesis of garden slug, in which he includes an author-date citation in parenthesis, which was the first known instance of referencing (Mark, 1881). References show the reader, the original work from where the ideas and shreds of evidence were gathered and which help the writer to shape his/her writing. In academic writing referencing is done in two parts- in-text referencing or citation and full reference or bibliography with all bibliographic information at the end of the writing. Citation means the

reference to a source (Betts, 2021; Connors, 1999; Wikipedia contributors, 2022). A specific referencing style is preferred by specific academic disciplines. However, the most common and well-known styles of referencing in research work are Harvard, APA, MLA, Vancouver, and Chicago styles (Alvi, 2016; Horkoff, 2015).

This present study aims to describe different styles of referencing in research publications. The objective is to find out different rules and formats of referencing used in Harvard, Chicago, MLA, and especially in APA style of referencing.

The present work is based on information gathered to elucidate the importance of referencing and it's formatting using different books and internet sources.

Result and discussion:

It has been found that the APA style is the most popular citation style widely used in social and behavioural science (Wikipedia). MLA style is the 2nd most popular style mainly used in the humanities. Chicago style is also popular in humanities, especially in Business, History, and Fine Arts. Harvard style is generally used by Economics. Referencing is done in two steps- in-text citation and bibliography or reference. In-text citation is the in-text references i.e. the part of the text within one's writing in the form of a direct quote, paraphrasing the essential element of someone else's idea in brief notation. Reference usually includes the information like name of the author, date of publication, name of the paper or chapter, name, and location of the publishing company, the title of the journal with volume no. or name of the book page nos., etc. and DOI (Digital object identifier). It should be at the end of the write-up in the form of a list started on a new page.

Some well-known referencing styles:

Harvard style of referencing:

Harvard style referencing is an author-date method, a parenthetical system most commonly used in UK and Australia. In Harvard referencing, in-text citations contain the author(s)'s or editor(s)'s last

name, year of publication and page number(s) e.g. (Fashing 2011, p.203). If more than one author, then the surname of all the authors is to be included like- Smith, Kelez, and Buchanon (2019, p. 207). In the case of four or more authors, the first author's last name should be stated followed by et al e.g (Acharya et al., 2020, pp 47- 51), et al. should be in italics. In a bibliographic list, the comma is not used between the Author's last name and year of publication. All other details of the publication are given in the list of references in a separate sheet at the end. The list must be organized alphabetically by the author. If there are multiple works by the same author, ordered by date, if the works are in the same year they are ordered alphabetically by the title and are allocated a letter (a,b,c, etc) after the date. The text should be in double space (Chernin, 1988 pp 1062- 1063).

Chicago style of referencing:

This type of referencing is generally used in academic writings related to Business, History, and Fine arts. It is one of the two citation styles obtained from the Chicago Manual of Style (17th edition) as (i) notes and bibliography and (ii) author-date style. In notes and bibliography style, sources are cited in numbered footnotes or endnotes. Each note is represented by a numbered superscript in the text after punctuation. Footnotes are used when a source is paraphrased or quoted. They appear at the bottom of the relevant page corresponding to the reference number in the text. Then sources are listed in a separate bibliography. Short notes contain the author's last name, shortened title of the article, and page numbers (e.g. Patrick, "Survival of humanities." 2020, 105). Footnotes with two or three authors should include the last name of all the authors and in case of four or more four authors, et al. will be written after the last name of the first author (e.g. Smith et al.). Multiple footnotes should not be placed at the same point in the text (e.g. 1, 2, 3) rather, all the citations are combined to form one footnote using semicolons (e.g. Hannah, "Slave and trade"; Bromwich, "Historical thoughts"; Benjamin, "Tales from a castle" 1. The bibliography includes the author's last name, first name, and "article title."Journal name, volume no., issue, page number(s),

doi or URL.

In the author-date system, sources are briefly cited in the text with the author's last name and year of publication, and page number in parenthesis with no punctuation in between (e.g. Patrick 2020). In case of quoting and paraphrasing, page number or page range should be added to direct the reader to the specific page after a comma (e.g. Patrick and Yeser 2020, 28-30) which is followed by full information in a reference list. In the case of multiple authors (more than four authors), the in-text citation should include et al., after the name of the first author. In the author-date system, the reference list is mandatory. In the reference list, unlike, in the case of note and bibliography style, the date of publication is placed immediately after the author's name (Caulfield 2022 November, 18).

The MLA style of referencing:

MLA referencing style is developed by the Modern Language Association, mainly followed in the field of humanities. The in-text citation is also a parenthetical system that contains the last name of the author and the page number or numbers which is referred to in the text. e.g. (Anderson 7) and if the author's name is mentioned in the text, only the page number appears in the citation e.g. "(7)". Publication dates receive less attention, and thus omit in-text citations, though normally stated in the work cited list. If there is a quote from two or more works from the same author then the in-text citation should include a shortened version of the title to indicate which book or journal is being referred to (e.g. Kulp, Primatol, 273). To cite a work with two or more authors, their names may be in the same order as in the article. The first author's name should be reversed then added a comma then add others' names in normal form (Last name, first name, and first name last name format e.g. Zhou, Qihai, and Fuwen Wei 660). For three or more authors, the in-text citation may include either the first author's name followed by et al. (like Plag, Ingo, et al., 239) or may give all names of the author in full as they appear on the title page of the book/ journal (Plag, Ingo, Maria Braun, Sabine Lappe, and Mareile Schramm, 239). In MLA- style referencing, the author's

name appears as given in the work (normally in full), every important word of the title is capitalized, and the publication date follows the publisher's name. Other details of the publication are given in the list of references. The title "Work cited" is given to the list, and only in-text cited references are to be included in the list. Titles of the published work (e.g. book, journal, etc.) are to be in italics. Titles of journal articles, essays or book chapters, or part of any large work or title of unpublished work are enclosed in double quotation marks, e.g. Bhowmick, A. "Primates in fragmented habitat may face extinction". Each reference carries a hanging indent i.e. the first line of each reference is flushed with the left margin, and the remaining lines are indented and end up with a full stop. The list is arranged in alphabetical order.

APA style of referencing:

It is developed by the American Psychological Association and is widely followed in the field of science, Social Science, Education, Engineering, etc. 7th Addition of the APA guide of referencing is followed for maintaining the reference page of academic writing. A reference must be on a new page at the end of the document, it should be centered, and be alphabetically by name of the first author. It is an author-date referencing style, so the in-text citation contains the last name of the author(s) and the year of publication in parentheses. No footnote or endnote is required in this type of reference.

Rules of in- text citation in APA style-

1. If the author's name is included in the text, then the year should be followed at the end of the sentence in parenthesis. For example, according to Berke the functioning of ecosystem engineers has been defined and conceptualized after a critical review (2010).

2. If the author's name is not in the text, then insert the author's last name and year of publication using a comma in between in parenthesis (e.g. the functioning of ecosystem engineers

has been defined and conceptualized after critical review (Berke, 2010).

3. If the author's name and year are included in the text, there is no need to repeat them in the parenthesis e.g. Berke in 2010 explained that the functioning of ecosystem engineer…..

4. The author can help the reader to search out materials in books or on web pages by inserting page number(s) or paragraph number in the citation. The page number is preceded by p. (for a single page) or pp for a page range (e.g. Jones, 2006, pp.12-26), and the paragraph is preceded by para (e.g. Krikpatrick, 2011 3).

5. If cited work has two authors, the last name of both authors should be included in the in-text citation using 'and'/ "&" between the names (e.g. Crain and Bertness, 2006).

6. If the cited article has three or more authors, that case, "et al." should be added after the last name of the first author and then the year of publication. et al. should be written in Italics in most cases (Stuart et al., 1985).

7. In case of eight or more authors, in-text citations will be the surname of the first author, then et al. with the date of publication e.g. (Brown et al. 2005) or Brown et al. (2005).

8. In the case of citation of multiple publications of the same author, the year of publications is separated by a comma in chronological order (from oldest to recent). In case of publication occurs in the same year, then suffixes a, b, and c, are used. For example Clutton- Brock, 1974, 1977a, 1977b).

9. For multiple publications of different authors, a semicolon (;) is used after each entry and citations should be first in alphabetical then in chronological order (e.g. Dublin, 1990; Laws, 1070; Post, 1981).

10. In case of citation of two authors with same surname but with different initials, in that case, intitials of the first author to be included in all the in-text citation (e.g. B. K. Choudhury & Dhar, 2010; T. Choudhury, 2012). If multiple authors with same surname shares the same article, citation will be simply in author date style (Borah & Borah, 2011) (*Citing Authors With the Same Surname*, n.d.; Caulfield, 2022).

11. To cite a paper presentation in conference etc. one should use the format of referencing as- Author name, Initials. (Year, Month Day- Dates). Paper title [paper presented] Conference Name, City, State, Country. URL. (Caulfield, 2022 June 16).

Rules for writing references in APA style:

Author rules:

i. The surname or last name of the author is written first, separated by a comma, then the initial(s) written. If the name contains more than one word, the initials of each word written are separated and ended by full stops. One space should be put in between the initials e.g. Arthur Froyed Richard will be written as Richard, A. F.

ii. In the case of multiple authors, the authors' names are separated by a comma and an ampersand (&). For example, Hung, C. M., Wei, F. W., Li, M., Li, Y. B. & Sun, R. Y.

iii. **Date rules**: Date refers to the date of publication of the article.

iv. **Title rule:** The format of the title changes depending on what is being referenced.

Table 1. A reference in APA style includes four questions systematically as who, when, what and where.

Who	When	What	Where	DOI/ URL (if any) /ISSN/ ISBN
Authors surname, initial(s).	Year of publication	Title of the book	Publisher's name	https://doi.org/xxx https://xxxx
For a book				
Jones, A. F & Wang, L.	(2011).	*Spectacular creatures: The Amazon rainforest* (2nd ed.).	My Publisher.	
For edited book (editor as author)				
Ruth, A. R. (ed.)	(2010).	*Climate change and sustainable development*	Linton Atlantic Books Ltd.	ISBN: 978-0981785455
Chapter in an edited book				
Chakravarty, A & Singha, S.	(2014).	*Fish diversity in Bongaigaon District In M. S. Sheikh (ed.), Biodiversity- Threats and Conservation (Vol. 2, pp. 11-213)*	Global Publishing House, India	ISBN:978-93-81563-48-9
For Journal article (Print)				
Chakravarty, A.	(2016).	*Adolescent health and nutrition.*	Pratibha, 4(4). 12-18.	ISSN-2349-5286
For Journal article (e- journal)				
Chakravarty, A., Saikia, M. K. & Saikia, P. K.	(2020).	*Population status, demography and conservation of golden Langur Trachypithecus geei in an isolated habitat of Kakoijana reserve forest, Assam, India.*	Asian Journal of Conservation Biology, 9(1), 25–38.	ISSN 2278-7666 (online) DOI: 10.53562/ajcb
Meeting/ Conference/ Symposium				
Randall, C. K.	(2020, February 8- 10).	*Promoting-human primate coexistence through field training and outreach education: Are we making a difference? Are we doing enough?* [Paper presentation]	1st International Conference on Human-Primate Interface, 2020	Guwahati, Assam, India.
Multi media and You Tube reference (e.g. You Tube Video)				
Chakravarty, A.	(2020, June 16).	Homing behavior in animals [Video]	YouTube	ttps://www.youtube.com/watch?v=gq3Fq0qSXu0

From the table 1, it was found that the format of referencing for books, journal articles, magazine articles, and other media publication is similar with some minor differences. The reference list should be prepared in alphabetical order with double spacing and hanging indents as shown below. The reference list should be titled "References" and to be centered 1" down, should not be capitalized, bold, or italicized. It should always be started on a separate page (Table 2).

Table 2. Reference list in APA style.

References

Gray, J., Evans, N., Taylor, B., Rizzo, J., & Walker, M. (2009). State of the evidence: the connection between breast cancer and the environment. International journal of occupational and environmental health, 15(1), 43–78. https://doi.org/10.1179/107735209799449761.

Sharma, K (2020). Why are cancer cases on rise in India? Here are the reasons. Times of India.com Retrieved from https://timesofindia.indiatimes.com/life-style/healthfitness/health-news/

If the author's name is missing, in that case, the in-text citation should be like the title of the paper and year of publication e.g. (Modern Essays, 2011) or Modern Essays (2011), and the citation for the reference page should be in the format- Title. (year). Source.

For example- Modern Essays. (2011). Arihant Publications. ISBN: 978-81-8348-215-8

If a date is missing, in-text and reference page citations should be (author, n.d.) of author (n.d.) and author (n.d.). Title. Source. In-text citation: Singh, n.d.). or Singh (n.d). For the reference page, Singh, A. (n.d.). Modern Essays. Arihant Publication. ISBN: 978-81-8348-215-8. If both author's name and date are missing, the in-text format should be (Title, n.d.)/ Title (n.d.) and the reference page citation format should be Title. (n.d.) source. For any personal communication, no entry should be there in the reference list, only in-text citations should be there with C.C. Communicator, Personal communication, Date, month, year).

Conclusion:

The APA citation style is the most widely used style of referencing in the world, however, different journals can opt for citation style as per their preference. However, keeping track of all the references and making sure that the same referencing style is followed throughout, might be an exhausting job. There are lots of tools that can help to

manage and format citation correctly. One can use Google Scholar, Library Search, and subject databases for cite options. Citation can also be generated using reference-building tools such as 'Cite This for Me' or 'ZoteroBIb'. One can also take the help of reference management software such as Mendeley, Zotero, or EndNote. However, it is essential to know the right format of the using referencing style, so that any mistakes or missing information can be identified and corrected.

References:

Alvi, Mohsin. (2016). A Manual for Referencing Styles in Research.

Betts, J. (2021, March 9). *APA Reference Page Examples and Format Guide.* Bibliography.com. https://www.bibliography.com/apa/apa-reference-page-examples-and-format-guide/https://www.ncl.ac.uk/academic-skills-kit/good-academic-practice/referencing/

Caulfield, J. (2022, June 16). *How to cite a conference paper in APA Style.* Scribbr. https://www.scribbr.com/apa-examples/conference-paper/

Caulfield, J. (2022, November 18). *Chicago Style Footnotes | Citation Format & Examples.* Scribbr. Retrieved November 23, 2022, from https://www.scribbr.com/chicago-style/footnotes/

Citing authors with the same surname. (n.d.). https://apastyle.apa.org. https://apastyle.apa.org/style-grammar guidelines/citations/basic-principles/citing-authors-same-surname

Chernin, E. (1988, October). The "Harvard system": a mystery dispelled. British Medical Journal, 297, 1062–1063.

Connors, R. J. (1999). The rhetoric of citation systems, Part II: Competing epistemic values in citation. Rhetoric Review, 17(2), 219–245. https://doi.org/10.1080/07350199909359242

Horkoff, T. (2015, August 24). *Chapter 9.Citations and Referencing – Writing for Success – 1st Canadian Edition.* Pressbooks. https://opentextbc.ca/writingforsuccess/chapter/chapter-9-citations-and-referencing/https://www.awelu.lu.se/referencing/quick-guides-to-reference-styles/documentary-note-style/

Wikipedia contributors. (2022, December 1). *Citation.* Wikipedia. https://en.wikipedia.org/wiki/Citationhttps://morningside.libguides.com/APA7/authors#

Mark, E. L. (1881). "Maturation, fecundation, and segmentation of Limax campestris, Binney". *Bulletin of the Museum of Comparative Zoology at Harvard College. 6: 194.*

MLA handbook for writers of research papers. Seventh Edition (2009) Modern Language Association of America, 10 Astor Place, New York, NY 10003-6981.

Publication Manual of the American Psychological Association, Seventh Edition (2020) (apa.org)

https://www.stylemanual.gov.au/referencing-and-attribution/documentary-note Retrieved on

10. 11. 2021

Formulating and testing Hypothesis in Research Methodology

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Abstract

Hypothesis Formulating is the one of most important aspect of Research process. The paper is intended as a brief explanation and encouraging discussion of the mechanism hypothesis formulation and testing used for the construction for human knowledge and the advance of science.The formulation of the hypotheses is based on empirical evidence of related literature, theories from connected research fields as well as conceptual Inconsideration based on a simple utility model using general agency theory assumptions.The formulation of hypothesis or proposal as to the possible answers to the Research questions is an most important move in the process of formulation of the research problem. Hypothesis is considered as the one of principal instrument in research. Formulation of a Problem is the first and foremost step in research process. It is not always easy to identify and define a problem in an ever changing business environment. Has to identify a problem specifically and throughly and then it has to be expressed in scientific analysis can be performed on that problem.One should arrive at a clear and specific working Hypothesis for which research methods already exists.A good Hypothesis States a research problem in concise and precise terms so that the researchers is focused on the problem at hand.Experimental validation of hypotheses requires formulating a Overall set of mutually monopolistic for a particular research question.

Keywords:
Hypothesis, Formulating, Research, Experimental, Methods, Investigation.

Introduction:

Research is a scientific and systematic search for various information about a specific topic.It is a systematic process of discovering new information capable of providing answers to some fundamental questions or providing insights on how to solve some identified problems.The information might be collected from different sources like experience, Human being, books journals, nature etc. Hypothesis are the mechanism and container of knowledge moving from the unknown to known.These elements from techniques and testing ground for scientific discovery. Hypothesis are tentative explanation and potential answers to a Problem. Hypothesis gives the direction and helps the researchers interpret data.In this paper,we will be familiarised with the term Hypothesis and it's characteristics, types of Hypothesis, Hypothesis formulation.Errors in Hypothesis testing are also highlighted. This unit discusses the principles and processes involved in identifying and drafting research problems and formulating Hypothesis.

Meaning of Research:

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, "research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods." Inductive research methods analyze an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysisa (Fleetwood,2021)

Objective of Research:

The main objective of the paper Formulating And Testing hypothesis in research methodology

- Analysis the meaning of research methodology
- Analysis the meaning of hypothesis
- Formulating Hypothesis
- Analysis types of hypothesis
- Analysis the errors in hypothesis

Meaning of Hypothesis:

The word hypothesis (plural is hypotheses) is derived from the Greek word 'hypotithenai' meaning to put under' or 'to suppose for a hypothesis to be put forward as a scientific hypothesis, the scientific method requires that one can test it. Etymologically hypothesis is made up of two words. "hypo" (less than) and "thesis", which mean less than or less certain than a thesis. It is the presumptive statement of a proposition or a reasonable guess, based upon the available evidence, which the researcher seeks to prove through his study. (anonymous, 2021, para 28)

A hypothesis is a statement that introduces a research question and proposes an expected result. It is an integral part of the scientific method that forms the basis of scientific experiments.Hypothesis is usually considered as the principal instrument in research. The derivation of a suitable hypothesis goes hand in hand with the selection of a research problem.

A hypothesis, as at tentative hunch, explains the situation under observation so as to design the study to prove or disprove it. What a researcher is looking for is a working or positive hypothesis. It is very difficult, laborious and time consuming to make adequate discriminations in the complex interplay of facts without hypothesis. It gives definite point and direction to the study, prevents blind search and indiscriminate gathering of data and helps to delimit the field of inquiry. (anonymous, 2021, para 27(.

Formulation of Hypothesis:

The formulation of hypothesis or proposition as to the possible answers to the research questions is an importance steps in the process of formulation of the research problem. Hypothesis is usually considered as the principal instrument in research. Its main function is to suggest new experiment and observations. Keen observation. creative thinking, hunch, unit, imagination, vision, insight and sound judgement are of greater importance in setting up reasonable hypotheses. A thorough knowledge about the phenomenon and related fields is of great value in its process. The formulation of hypotheses plays an important part in the growth of knowledge in every science. The hypotheses are formulated to facilitate the findings of the research study. (Mahalaxmi, 2017, para 1).

Structure of Hypothesis:

Whilst all pieces of quantitative research have some dilemma, issue or problem that they are trying to investigate, the focus in hypothesis testing is to find ways to structure these in such a way that we can test them effectively. Typically, it is important to: www. statistics. laerd.com, 2018, Para 1)

1. Define the research hypothesis for the study
2. Explain how you are going to operationalize (that is, measure or operationally define) what you are studying and set out the variables to be studied.
3. Set out the null and alternative hypothesis (or more than one hypothesis; in other words, a number of hypotheses).
4. Set the significance level.
5. Make a one- or two-tailed prediction.
6. Determine whether the distribution that you are studying is normal (this has implications for the types of statistical tests that you can run on your data).
7. Select an appropriate statistical test based on the variables you have defined and whether the distribution is normal or not.
8. Run the statistical tests on your data and interpret the output.
9. Reject or fail to reject the null hypothesi Reject or fail to reject the null hypothesis.

Whilst there are some variations to this structure, it is adopted by most thorough quantitative research studies. We focus on the first five steps in the process, as well as the decision to either reject or fail to reject the null hypothesis. You can get guidance on which statistical test to run by using our Statistical Test Selector.
(www.statistics.laerd.com, 2018, Para 2)

Types of Hypothesis:

1. Alternative Hypothesis

In the academic domain, it is very often denoted as H1. The significance of this kind is to identify the expected outcome of your research procedure. Additionally, it is further classified into two subcategories:

a. Directional: A statement that defines the ways through which the expected results will be gathered. It is generally used in the cases where you need to establish a relationship between various variables rather than making any comparison between multiple groups. For example, Attending physiotherapy sessions will improve the on-field performance of athletes.

b. No directional: As the name suggests, a non-directional alternative hypothesis doesn't suggest any direction for the expected outcomes. For example, Attending physiotherapy sessions influence the on-field performance of athletes.

Now in the above two examples, carefully observe the two statements. The directional statement specifies that physiotherapy sessions will improve or boost performance. On the other hand, the non-directional statement helps establish a correlation between the two variables (physiotherapy sessions and performance). However, it does not emphasize whether the performance will be good or bad due to physiotherapy sessions.

2. Null Hypothesis

A null hypothesis is denoted as H0. A null hypothesis exists as opposed to an alternative hypothesis. It is a statement that defines the

opposite of the expected results or outcomes throughout your research. In simpler terms, a null hypothesis is used to establish a claim that no relationship exists between the variables defined in the hypothesis.

To give you an idea about how to write a null hypothesis, the last example can be stated as:
The physiotherapy sessions do not affect athletes' on-field performance.

Both the null and alternative hypotheses are written to provide specific clarifications and examination of the research problem. So, to clarify confusion, the difference between a research problem statement and a hypothesis is that the former is just a question that can't be validated or tested. In contrast, the latter can be tested, validated, or denied.

3. Simple Hypothesis

It is a statement that is made to reflect the relation between the dependent and independent variables. Follow through the example, and you will understand,

a. Smoking is a prominent cause of lung cancer

b. Intake of sugar-rich foods can lead to obesity

4. Complex Hypothesis

A complex hypothesis implies the relationship between multiple dependent or independent variables stated in the research problem. Follow through the below examples for better clarity on this:

a. Individuals who eat more fruits tend to have higher immunity, lesser cholesterol, and high metabolism.

b. Including short breaks during work hours can lead to higher concentration and boost productivity.

5. Empirical Hypothesis

It is also referred to as the "Working Hypothesis." This type of claim is made when a theory is being validated through an experiment

and observation. This way, the statement appears justifiable enough and different from a wild guess.

Here are a few examples through which you can learn to create an empirical hypothesis:

a. Women who take iron tablets face a lesser risk of anemia than those women who take vitamin B12.
b. Canines learn faster if they are provided with food immediately after they obey a command.

6. Statistical Hypothesis

A statement claiming an explanation after studying a sample of the population is called a statistical hypothesis. It is a type of logic-based analysis where you research a specific population and gather evidence through a particular sample size.

Below are some hypothetical statistical statements to understand how you can conduct your research leveraging statistical data :

a. 44% of the Indian population belong in the age group of 22-27
b. 47% of the rural population in India is involved in agro-based activities.(deeptanshu, 2021, Para 1,2,3) Characteristics of Hypothesis:

1. Helps predict final outcome

Hypothesis are proposed explanations. These explanations may or may not be be true. Hypothesis gives theresearcher an idea of what the outcome of research will be. This makes the researcher well prepared for the finalresult. The researcher knows what he is most likely to expect. This helps him find the final solution much easier.

2. Gives Direction

A Hypothesis gives clear objectives to the researcher. It tells the researcher what he should do and what he shouldfind out in his research study. It helps researcher choose the correct research methods. Hypothesis is essential in the planning stage of a research as it gives a

path and direction.

3. Helps in Data Collection

A researcher may get confused as to what kind of data he must collect. Hypotheses statements helps researcherchoose the right kind of data. It tells the researcher where to collect the data and from whom.

4. Helps in Writing Report

When a researcher writes his report, he is to mention the result clearly and in a well-organized way. Hypothesishelps researcher is writing his report neatly, mentioning each conclusion next to each and every hypothesis statedbefore. On the basis of the conclusion, he can make the research interesting and meaningful to the reader

5. Establishes Relationship between the Variables

In research work, the researcher will come across various variables. A hypothesis lets the researcher know whichvariables are independent, dependent or intervening. It also helps in avoiding extraneous variables.(Chauaungo,2019,Para 3)

Scientific Hypothesis:

Scientific hypothesis, an idea that proposes a tentative explanation about a phenomenon or a narrow set of phenomena observed in the natural world. The two primary features of a scientifichypothesisare falsifiability and testability, which are reflected in an "If…then" statement summarizing the idea and in the ability to be supported or refuted through observation and experimentation. The notion of the scientific hypothesis as both falsifiable and testable was advanced in the mid-20th century by Austrian-born British philosopherKarl Popper. (Rogers, 2018, Para1)

The formulation and testing of a hypothesis is part of thescientific method, the approach scientists use when attempting to understand and test ideas about natural phenomena. The generation of a hypothesis frequently is described as a creative process and is based on exist-

ing scientific knowledge,intuition, or experience. Therefore, although scientifichypothesescommonly are described as educated guesses, they actually are more informed than a guess. In addition, scientists generally strive to develop simple hypotheses, since these are easier to test relative to hypotheses that involve many different variables and potential outcomes.

Such complex hypotheses may be developed as scientific models. (Rogers, 2018, Para2)

Statistical Hypothesis Testing:

After setting up the hypothesis we obtain the required test statistic using the sample observations the hypothetical value of the parameter under consideration. The formulse of test statistic underelsfferent requirements and conditions are discussed later. Since test statistic is calculated from sample observations, it is a statistic and has some sampling distribution. In case of large samples, the distribution of test statistic becomes normal distribution, while in case of small samples we use other sampling distributions, e.g., -distribution, F-distribution, and chisquaredistribution.The distribution of test statistic is used in order to reject or accept the mall hypothesis. Critical value divides the area under probability curve of the distribution of test statistic into two regions critical (or rejection) region and acceptance region. Size of critical region is given by level of significance a while the size of acceptance region is (1-a) When the statistical outcome (the value of teg statistic) falls into the critical region. H, is rejected. When the statistical outcome falls into acceptance region, H, is accepted. (Kotharui, 2021, 183-184)

Errors in Hypothesis testing:

1 TypesI error A type I error, also known as an error of the first kind, is the wrong decision that is made when a test rejects a true null hypothesis (HO). A type I error may be compared with a so called false positive in other test situations 2.Type Il error A type Il error, also known as an error of the second kind, is the wrong decision that is made when a test fails to reject a false null hypothesis. A type II error may be compared with a so-called false negative in other test situations.

- What we actually call type I or type II error depends directly on the null hypothesis. Negation of the null hypothesis causes type I and type Il errors to switch roles.

2. The goal of the test is to determine if the null hypothesis can be rejected. A statistical test can either reject (prove false) or fail to reject (fail to prove false) a null hypothesis, but never prove it true (i.e., failing to reject a null hypothesis does not prove it true). (Jain , 2021, Para 3, 4)

E.g Type I error (false positive): the test result says you have coronavirus, but you actually don't.

Type II error (false negative): the test result says you don't have coronavirus, but you actually do.

Conclusion:

In this Paper discuss about hypothesis formulation and sampling. A hypothesis is a speculative statement that is subjected to verification through a research investigation. In formulating a hypothesis it is important to ensure that it is simple, specific and conceptually clear; is able to be verified; is rooted in an existing body of knowledge; and able to be operational zed. There are two broad types of hypothesis: a null hypothesis and an alternate hypothesis. The functions of hypothesis are a temporary solution of a problem concerning with some truth which enables an investigator to start his research works. And it offers a basis in establishing the specifics what to study for and may provide possible solutions to the problem. Researchers formulate hypotheses using induction and deduction, one of the goals of researcher is to produce that piece for generalizable bodies of theory which will provide answers to practical problems. Hypothesis construction and testing enable researchers to generalize their findings beyond the specific conditions which they were obtained.

Works cited:

- D, Deeptanshu, How to Write a Good Research Hypothesis, https://typeset-io.cdn.ampproject.org, 9 Nov, 2021.Web, 20 Nov, 2021.
- Jain, Ishan, Types I and Types II Errors with Examples, www.Scribd.com, Web. 22, NOV, 2021.
- Kothari, CR, Garg, Gaurav, Test Statistic and Critical and Region, Research Methodology: Methods and Techniques, New Delhi: New age International (P) Limited, Publishers, 2021. 183-184.Prin
- Priya, Jyoti, Formulation of Hypothesis, www.Scribd.com, 2018.web, 19/ November/2021.
- Rogers, kara, Scientific hypothesis,https://www.britannica.com, 5 Sept, 2018.Web, 19. Nov, 2021.

Popular Culture and Reception of Genda Phool Song: A study through two modes of data analysis

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Abstract

Badshah in his "Genda Phool" hasn't been able to become an appropriator in soulfuls like Dijendra Lal Ray in "Dhana Dhanye Puspe Bhora" or Rabindranath Tagore in "Sokhi Bhabona Kahare Bole" as unlike these two legendary heart-touching songs which are in their earnest attempt to find out a metaphysical/philosophical understanding of our lives. Badshah's "Genda Phool" virulently only projects bisexual disgrace, noxious masculinity and gender injustice. Amidst innumerable video on social media of Indian rapper, Badshah's "Genda Phool " which itself is a plagiarized content as the boastful rapper stole lyrics from an old Bengali folk song called "Boroloker Bitilo" without owing any credit to its original writer singer Ratan Kahar. However, Badshah was credited for the composition and lyrics of "Genda Phool" across streaming platforms.

By applying quantitative and qualitative research methodology like survey and data analysis I would like to present that how the plagiarized work of art got acceptance as original. In my paper I want to analyse the research methodology which aims at finding the truth but it may sometimes suggests a deviated conclusion.

Key words: Adventure, Plebeian, Noxious, Plagiarism etc.

Hypothesis:

It is a matter of fact that, many songs getting popular attention are not original in production. But the writers or producers failure neglect to acknowledge the original version or artist for sheer sense of popularity. "Genda Phool" rendered by Badshah has not only plagiarised from Ratan Kahar's "Boroloker Bitilo" but also nuanced it with some sexuality for attracting the youthful audience for both fame and fortune. The relation between commercialisation of folk songs and its contextual ethics are definitely jeopardising the both the treasure and sensibility of generalition.

Methodology

In this paper the primary sources of data are collected through secondary data's. Beside, computer and online sources are used.

Introduction

"Genda Phool" emerged on March 26, 2020 amidst a nation-wide lockdown over the Covid-19 pandemic. The music video for the track, which also features the voice of Payal Dev, has Badshah romancing Jacqueline Fernandez at a Durga puja event. The catchy hook song is taken from the Bengali folk lyric "Boroloker Bitilo", originally written by singer Ratan Kahar.

"Boroloker Bitilo" was written in 1972 and performed by Swapna Chakravarti in 1976. The original tune is on Saregamapa Bengali's official YouTube channel, and remains popular among Bengalis. There are multiple grounds for copyright violation in "Genda Phool". Folk music is often adapted to be in existence for generations, which is collectively "owned" by one or more group or communities, and is likely to be of anonymous origin. In such cases, the present copyright regime does not grant a monopoly to any individual or set of individuals. The music is free to be used and recreated.

Moral Rights

Apart from economic rights, there are special rights, better known as "moral rights". Section 57 of the Copyright Act, 1957, talks of the author's special rights, which includes the right to paternity and the right to integrity.

Moral rights represent social values concerning authorship, creativity and artistic work. Such rights flow from the fact that a literary or artistic work reflects the personality of the creator, just as much as economic rights reflects the author's need to keep body and soul together. Moral rights bring a cultural focus to copyright laws. The right to paternity allows the author to claim authorship over his work.

In the case of "Genda Phool", not giving due credit to the actual lyricist as well as the singer violates the right to paternity. Even though it might be a common industry practice to lift parts of songs originally written and/or composed by others, credit has to be given to the original author and composer.

Secondly, the original song has a very specific context. It is about an unmarried mother sitting with her daughter, tying her long and luscious hair. The mother talks about being abandoned by her lover, who is from a wealthy family. Her daughter is beautiful because she has the genes of a rich father, according to Kahar's lyrics.

The music video of Badshah's version of a folk song born out of a woman's tragic life story sexually fetishes the woman. The original tune's history and context have been jeopardised. The right to integrity prohibits any distortion, mutilation or other modification of the author's work. "Modification", in the sense of the prevention of the original, will amount to distortion or mutilation.

Analysis of the Song

The video of "Genda Phool" is set in the scene of a Durga Puja with Jacqueline Fernandez performing *dhunuchi naach* wearing a *laal-paar sari, alta,* and a *lal bindi.* All of which are important cultural markers. While the cinematographer focuses on sexualizing Jacqueline Fernandez through the camera cuts, Badshah's lyrics talk about how she walks, how her butt moves, and her having a butterfly tattoo on her waist. The lyrics also feature sexual innuendos including, for some reason, *"lelu teri wicket wicket".* The song makes his characterisation of Fernandez's skin as "butter" fairly clear as well, Badshah also periodically licks his lips in the song video while singing said lyrics.

Sung from the point of view of a prostitute, *"Boroloker Bitilo, lomba lomba chool, emon mathay bedhe debo, lal genda phool"*, the song tells a story of an abandoned woman, wondering to her daughter while tying her long hair with a marigold whether she is the daughter of a rich man. The woman reflects on her life in the rest of the song, her relationship with her ex-husband and her current status.

The fact that this poetic and beautiful chorus is placed in the middle of a song hyper sexualising a woman and the way she walks, is genuinely disturbing.

Badshah is suffering from a Bloomian Anxiety of Influence in the sense that if he fails to stereotypically represent the cartography of the women's body used for men's carnal satisfaction and for penetration or anchoring *"..... in the bay where all men ride"*, (*Shakespeare*) he will be tagged as "Other" by his macho predecessors or by his contemporary misogynistic rapper who have again and again projected women as objects of men's sexual desire in their hits in order to worship toxic masculinity and male ego.

Misogyny in songs is nothing new; it seems to have ingrained itself deeply. Lyrics as well as the videos that supplement them showcase a myriad of sexist tropes. Most often they consist of explicit descriptions of female bodies through the male gaze, hyper sexualising and objectifying them, be it by comparing waists to butter or skin to *tandoori murgis*. Common imagery seen in the videos is that of groups of men raising glasses and surrounding a single woman.Oindrila Dasgupta comments, *"Misogyny in songs continues to be a major issue, and Badshah with "Genda Phool" is guilty as charged. Additionally, one cannot ignore the caste and class implications of the matter. This instance, with Badshah's massive social as well as financial capital, highlights the inequality in our society which can even sway credit for something as personal as art in the favour of the privileged"* (*Instar*).

For this paper, I tookinto account both quantitative and qualitative data from the online platforms especially YouTube on which it was released. The song is recorded as the 4th most watched music video on YouTube for the year 2020 across the world. It has above 800 million views on YouTube that marks it as one of the most successful

song to have been put across for the year. And the most watched music video for the same. MWV records Badshah as world's No. 1 songwriter across multiple platforms for the same year owing to the massive success of the song. It has also been recorded as trending no. 1 on JioSaavan and various other music apps.

Now as we move across to the qualitative datas derived through the process of observation, interviews and focus groups we analyse nuance from the above numerical datas. The datas collected from various sources are listed below:

Surmayi Khatana opines that , *"The effects of said songs are very harmful as they push forth existing imbalances in society. Especially with how they further* ***rape culture*** *in India. Even post* ***#MeToo*** *which managed to bring the discussions and critique to the forefront not much seems to have changed. It has been more than a year since the* ***#MeToo*** *movement went on to highlight the sexual harassment and misogynist nature in and of various industries, including the Music Industry and Bollywood. Yet, clear progress has not been visible at least when it comes to such music."* Since certain artists have a vast outreach, they play a key role in shaping the minds of individuals and their behaviours. Such music then tends to **normalise acts like stalking**.

Highlighting the commodification as well as the sexualisation of culture, Oishani Chowdhary says, *"My parents used to sing it to me, we had a radio on which we would play cassettes. It is just sad because it's a fraction of my childhood being sexualised to cater to masses that do not understand or appreciate Bengali culture"* She adds, *"I'm sorry but it does not even qualify as art if you're stealing from a certain individual/group that has negligible to no exposure, mostly because your grouphegemonies said art".*

Genda phool is packed with the general *sexist essentials, choreography intended to create a spectacle out of the female lead's body with enough camera sweeps to focus on specific body parts, a very clear emphasis on jacqueline being like "butter" (and sugar) in the lyrics: all tied up together with the ribbon of plagiarism.*

Rape culture is heavily propagated by this music, with females laying or being suspended above a mass of men with their hands reaching out to them, and ideas of clothing defining consent and/or consent not having any value at all.

Do you think it as original?

In that query Ankur Choudhary responses, "*the song is original but this is a very old Bengali folk songs written by Ratan Kahar, a very poor artist got no appreciation at that time. Badshah made few changes in the lyrics in his part and released the song with words full of lust.*"

Will you consider this song as vulgar or artistic?

According to Senjuti Chakravarti, "*I am not a connoisseur of rap and hip hop and can't really tell the good from the bad in that genre. This time round Badshah, in a fit of what he believes is art, has chosen to immortalisedthe Bengali girl. As I am a Bengali woman, I think that the worst part, worse than his prowling "swag", is that he has cliche idea about how Bengali men describe our women. Bengal's rich literary culture is rife with elaborate descriptions of the female form. Sex has never been a taboo subject among us. We worship Maa Durga and unlike how her incarnations are worshipped in other parts of India- especially North India- our Durga comes across as our daughter.*

Although, the music of the song is very good and artistic but the song lost the original essence of folk into the these vulgar words." (YouTube)

"People like badshah are supposedly being paid for spoiling the youth and culture of this country....I fail to understand what's there to like in his songs other than cheapness, sleaze and women objectification!!!" (Sandeep M, former world traveller)

"Baadshah didn't take any permission from the composer of original Bengali folk song of Genda Phool, this is the wrong what happened to this song because every composer or lyricist wants to get recognized through his/her music but here it was not. If you see the newspaper or social media regarding this issue, the lyricist Sh. Ratan Kahar has said that Baadshah has twisted the song so badly who wrote this original Bengali folk song while on the other hand Baadshah has said that my new single song is not the remake of a old Bengali folk song and he claims that we decided to sample the Bengali folk song into the single. Since sampling of a song should not be done to a large extent what other singers or musicians think. Baadshah has used a lot lyrical and vocal part of the original Bengali folk song Genda Phool (Boro loker Beti lo)..." (Rahul Mehra, Master of Commerce from Annmalai University)

Conclusion:

To conclude my paper, at the heart of the controversy surrounding Badshah's song "Genda Phool" lies a simple truth: all folk compositions in the public domain are not "*expressions of traditional culture or folklore*", and therefore cannot be reproduced or sampled at will. If we approach the case by means of statistical analysis on the basis of datas available online, it directs us to conclude in favour of the immense success of the song in terms of reception among the audiences. As evident from the no. of views on YouTube, i.e. 886M with 6.1 M likes on the song. It is also recognised as the 4th most watched music video on YouTube for the year 2020 across the world. But it is only through aQualitative consideration of data in terms of comments, and varied opinions perceived through process of observation, interviews and focus groups that we conclude about the underlying contestation over truth and originality that gives us a nuanced view in terms of reception among the audience. In continuation with our observation, we also come across how it is only with qualitative data analysis that issues entailing male gaze, hypersexual view of women's body and appropriation of culture that surrounds the engagement with the song is brought into light.

Work Citation

1. AWS. *Badshah's Genda Phool.* Quora. 7May, 2020. Web. 24 Nov, 2021.
2. *Badshah's Genda Phool.* YouTube, Sony Music India. 26 Mar, 2020,www.youtube.com/watch?v=SD4Z8dlZPd8. 24 Nov, 2021.
3. D, Hirak. *What is Wrong with Badshah's Genda Phool?.* timesofindia. 29 March, 2020. Web. 24 Nov, 2021.
4. Gawade, Hrishikesh. *Badshah Shares hilarious "Genda Phool" meme video, shows his Esprit de corps; Watch.* Republicworld. 20 July, 2020. Web. 24 Nov, 2021.
5. IANS.*Genda Phool Controversy.* www.india.com. 12 April, 2020. Web. 24 Nov, 2021.

Theoretical framework in research

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Abstract

Theoretical Framework in Research is a scientific methodology in research paper. Theoretical Framework in Research uses experimental methodology to draw upon own experience in art and systematic literature review methodology to draw upon supporting scholarly literature by guidance in the surrounding to subscribe to existing knowledge on the meaning of each ideas and more importantly to recognize between them in a study of research methods and in materials as they relate to sketching a research proposal and a thesis for higher degree. It's derives from an in-depth study of scholar recognizaton in vietames high degrees using multi-methods of data collection. The first aim is to help the scholar develop of gripe of the meaning of these ideas and how they should be used in formative research discourse. Here I will find out the some objectives of theoretical framework in research paper. What is the meaning of these terms,When, where and how should each be used. What kind of purposes does a theoretical framework serve out. How do we develop a theoretical framework for our research proposal and thesis,What does a good theoretical framework look like.

Key words

Theory, theoretical framework, conceptual framework, research proposal, thesis.

Objectives

a) Theoretical framework is a theory in the form of a model/ paradigm that serves as the basis for the study. It mentions the proponents of the study and their results.
b) To portray accurately the characteristics of a particular individual, situation or a group.
c) To determine the frequency with something occurs or with which it is associated with something else.
d) To test of a casual relationship between verbals.

Introduction

Theoretical Framework in Research is a methodology of higher degree research. It is a evaluating research proposals as a member or chair of the confirmation panel or Committe which assesses applications for confirmation of canditure into a higher degree at our university as an external examiner of theses from several universities, Theoretical framework, and conceptual framework are among those topics on which we, as educators of higher degree research student should spend a lot more time. Many students appear to have considerable difficulties with these concepts. We used terms like my theory is, my conceptual framework, my theoretical schema is, as though these terms are directly interchangeable. The confusion by saying things like my theory is phenomenology and even my theoretical paradigm. It would also appear that much as it is widely accepted that research methods is a specialized subject where terminologies have specific meanings, this understanding tends to be relaxed when many authors write about using theories in their research and they, for instance we the terms theory, conceptual framework and theoretical as though they all mean the same thing, and therefore interchangeable. In Research Methods, however, very few of the very good scholars have a theory they can call their own. In consideration of this substantial challenge, I have designed this paper to achieve five objectives, it should help the reader to develop an understanding of what we mean by a theory and a theoretical framework for a research project. Second, it should help a distinction between a theoretical framework, and a conceptual framework. Thirdly, this paper makes it clear that whereas every PHD thesis must develop and use one, because of the very important role a theoretical framework plays in the analysis and making meaning of our data. Fourthly, the paper explains how a theoretical framework for a research project is develop. Finally, I provide an example of the development of a real theoretical framework and explains how it could be applied in data analysis.

Systematic literature review methodology: Theory

Systematic review of pertinent literature provides the understanding that a theory is a generalised statement of abstractions or ideas that asserts, explains or predicts relationship or connections between phenomena within the limits of critical bounding assumptions that the theory explicitly makes. The generalised statement brings together ideas, interrelated concept, definitions, and proposition that explain or predict events or situations by specifying relations among variables. The ideas concepts and themes, constitute a deep and broad base of knowledge in the discipline -which constitutes the theory. These ideas, concepts, and themes together compromise the theory, which enables us to explain the meaning, nature, relationships and challenges asserted, or predicted to be associated with a phenomenon in an educational or sciences contexts, so that an application of those attributes of the theory, enables us to understand the phenomenan and to act more appropriately, including ability to predict. A theory

usually emerges from a long process of research that uses empirical data to make assertion based on deductive and inductive analysis of the data. The theory, research and practice are part of a continuum for understanding the determinants of behaviors, testing strategies for same, and disseminating effective interventions. The three are inextricably interlinked. This understanding increases the body of knowledge in the field and provides a basis for further theorisation, research, and understanding.

Characteristic of a theory

A review of their work suggest that for a body of assertions or

predictions of behavior or relationship to qualify as a theory, it must meet the following characters It has to be logical and coherent, It has clear definitions of terms or variables, and has boundary conditions. It has a domain where it applies.It has clearly described relationships among variables, It describes, explains, and makes specific predictions,It comprises concepts, themes, principles and constructs, It must have been based on empirical data, It must have made claims that are subject to testing, been tested and verified, It must be clear and parsimonious,Its assertions or predictions must be different and better than those in existing theories, Its predictions must be general enough to be applicable to and in several contexts,Its assertions or predictions are applicable, and if applied as predicted, will result in the predicted outcome,The assertions and predictions are not set in concrete, but subject to revision and improvement as social scientists use the theory to make sense of phenomena in their world.

Theoretical framework definied

A theoretical framework comprises the theories expressed by experts in the field into which you plan to research, which you draw upon to provide a theoretical coat hanger for your data analysis and interpretation of results. Put differently, the theoretical framework is a structure that summarizes concepts and theories, which you develop from previously tested and published knowledge which you synthesize to help you have a theoretical background, or basis for your data analysis and interpretation of the meaning contained in your research data.Rather, it is a synthesis of the thoughts of giants in your field of research, as they relate to your proposed research or thesis, as you understand those theories, and how you will use those theories to understand data.About the problem you plan to investigate, and might even include suggestions of how to solve that problem, including how to interpret the findings in your data. What those leaders say, helps you to develop an informed, and specialized lens, through which you examine your data, conduct the data analysis, interpret the findings, discuss them, and even make recommendations, and conclusions.It must reflect academic rigor and skills. Situating your research findings

within your theoretical framework helps you to provide that rigor and skills. You can look at the theoretical framework as a structure or a data mining lens that uses knowledge from research done to date in your field, to make sense of the data in your own research study.

Meaning of a theoretical framework differ from a conceptual Framework

A conceptual framework is the total, logical orientation and associations of anything and everything that forms the underlying thinking, structures, plans and practices and implementation of your entire research project. The conceptual framework is thus the umbrella term relating to all the concepts and ideas that occupy your mind as you contemplate, plan, implement and conclude your research project. Thus, whereas the conceptual framework could be the product of your own thinking about your research study, the theoretical framework comprises other people's theoretical perspectives that you interpret as relevant to your research, and in particular,helpful in your data analysis andinterpretation.For all your practical purposes, there is no need to explain your conceptual framework. It is too diverse, too big a task for you to explain in a research proposal or a thesis.

The purpose and importance of a theoretical framework for our research

A theoretical framework for your research is so as to have a scholarly foundation for all your sense making of the meaning contained in your data. The theoretical framework provides a structure for what to look for in the data. It helps you to make connections between the abstract and concrete elements you observe in your data. Furthermore, in addition to spelling out the assumptions, you also articulate which variables you will analyze. This helps you to make your data analysis and interpretation more focused..Again, as I have said above, because your thesis is a piece of academic, scholarly writing, the theoretical framework gives you the opportunity to demonstrate your capability, as an emerging researcher, to intellectually transition from simply describing your data to engaging in higher-order cognitive analysis,

evaluation and synthesis of your data.This enables you to demonstrate your contribution to knowledge and scholarship, and because this is what you get awarded a PhD for, that is why I said at the start of this paper, that a theoretical framework is a must for a PhD thesis.

Develop of a theoretical framework

An existing theory is not likely to provide plausible explanations of the meaning contained in your data, without modification. This is because, by definition, a theory, as we saw earlier, is an abstraction, a generalization, and therefore, it is not content, or topic specific. In contrast, by definition, your theoretical framework is ananalytical structure you put together or develop to suit your research purposes, which as you know.Asking yourself the following questions, should help you to develop an effective theoretical framework, tailored to your own data analysis needs: Is there a theory that can help me to make sense of the meaning of the data that I will gather to answer the research questions.As discussed in the paper, the trifecta entails the differences between a theory, a theoretical framework and a conceptual framework. The paper has made it very clear that whereas the theoretical framework is drawn from the existing theoretical literature that you review about your research topic, a conceptual framework is a much broader concept that encompasses, practically all aspects of your research. However, there is no requirement for an articulation of the conceptual framework.Thus, whereas every dissertation should contain a section titled theoretical framework; and if a doctoral thesis a chapter of this title, there is no requirement that you have a section or chapter discussing the conceptual framework for your research project.Are there theories that have been developed in the field of my research topic, or in similar topics that might inform an understanding of my research question, my research problem and data analysis.

Look like of a theoretical framework

I think that a good way to facilitate your understanding of what a theoretical framework looks like is to outline an example. The example I have chosen is designed to help you understand how you can take

an existing theoretical model, and re-frame it so that it serves as the theoretical framework for your own research. Students participate in learning activities as partners in knowledge construction, in a self-regulated learning way. Learning strategies are studentcentered, providing scaffolding. They comprise rich learning tasks and involve cooperative learning teams. The strategies used by the teacher are challenging and try to extend the children's understanding of what they learn. The strategies are not only interesting but motivational.Classroom tasks are goal-oriented, motivational, tolerant, diverse inclusive, orderly and encourage social interdependence. Assessment is for learning and is authentic, targeting higher-order learning.The report cards consist of grades that make sense to the children, parents, the school and other stakeholders.Reporting targets the learning outcomes that the children are expected to achieve as per their learning stage. The reports are accurate and comprehensive. These processes are all interrelated in a dynamic quality-learning environment that plans and facilitates intellectual quality learning in which children are engaged in the construction of deep knowledge and understanding of ideas, concepts, issues and skills that have significance in their lives at school and beyond school.In other words, how does an application of what the different elements of this model theorize, help you to make meaning of your research data.

Conclusion

Let me conclude this paper by highlighting the fact that this paper has tried to make a contribution to knowledge by addressing a trifecta of problematic concepts that HDR students and early career researcher often find confusing. As discussed in the paper, the trifecta entails the differences between a theory, a theoretical framework and a conceptual framework. The paper has made it very clear that whereas the theoretical framework is

drawn from the existing theoretical literature that you review about your research topic, a conceptual framework is a much broader concept that encompasses, practically all aspects of your research.In conclusion, every good thesis should contain a theoretical framework for the

analysis of the data.It is the expectation that a graduate from a good university, will have a good understanding of the three concepts discussed in this paper, and be able to use them in their research, publications, teaching and discourse, without confusion. I hope that this paper has helped in enabling the reader to meet these expectations.

Works cited

- *Johnson, R.B. & Christensen, L. (2017). Educational research: quantitative, qualitative, and mixed approaches. Los Angeles: Sage.*
- *Ravitch, S. M. & Riggan, M. (2017). How conceptual frameworks guide research.* 2nd Edn. Los Angeles, CA: Sage.
- *Carnes, M. C. (2011). Setting Students' Minds on Fire, Chronicle of Higher Education, 57(27), 72.*
- *Gabriel, A. (2008). The meaning of theory. Sociological Theory, 26, 173 – 199.*
- *https://doi.org/10.1111/j.1467-9558.2008.00324.x*

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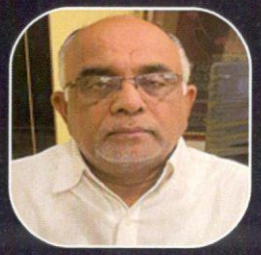

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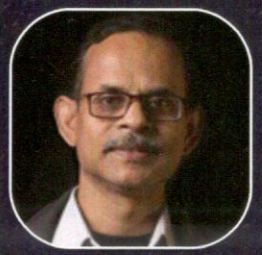

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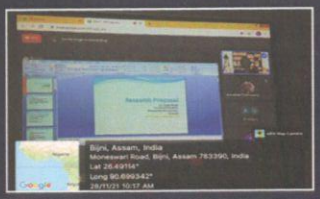

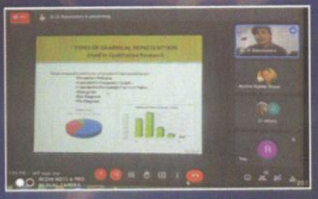

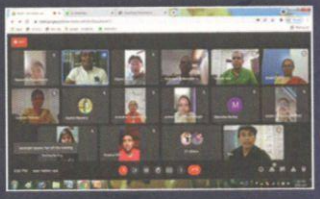

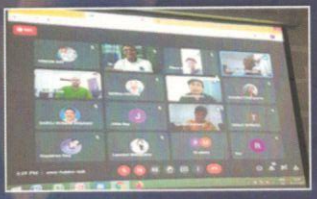

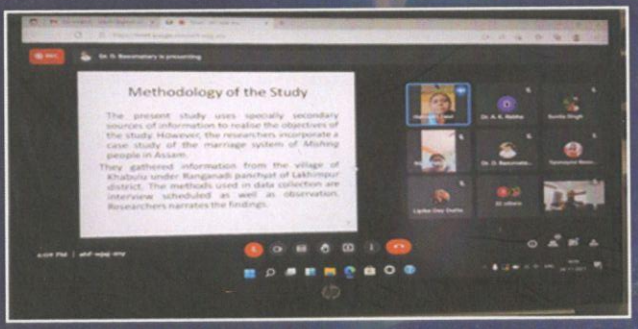

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