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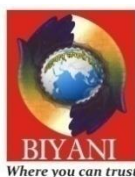
13th Biyani National Seminar

ICSSR

Methods of Measuring and Interpretation of Outcomes in Educational and Social Research

April 14 -15, 2022

Organized by:

BIYANI
Where you can trust

Biyani Girls B.Ed. College
Department of Education
Jaipur, India

Copies of this proceeding are available for purchase. Please contact at   biyaniseminar2022@gmail.com, c/o R-4, Sector-3, Vidhyadhar Nagar, Jaipur-302039, Rajasthan (India) for ordering information.

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All papers of the present proceeding were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers's recommendation were positive.

Preface

In present seceanario it has been found that the quality of research depends on the understanding of the research problem and the output. It is significantaly based on the appropriate research tool and it's interpretation so Biyani Girls B.Ed. College takes the initiative to organize a national seminar on April 14 – 15 2022 focused on the theme "methods of measuring and interpretation of outcomes in educational and social research". The main objectives of this seminar are -

1. To understand the different types of tool to collect data in research.
2. To understand the value of tools, their place in research and way to prepare their interpretation and results.
3. To understand the construction of standardize and non-standardize tool.
4. To provide training of preparing standardize tool.
5. To develop analytical skills.
6. To develop the capacity of finding out vailidity and reliability.

This two days Seminar has six technical sessions. Sessions topics includes:

1. Technical Session-1 : Concept and Ethics of Developing A Research Tool
2. Technical Session-2 : Introduction of Different Types of Data Collection Instruments
3. Technical Session-3 : Process of Construction of Standardize Tool: Validity, Reliability, Objectivity, Item Analysis
4. Technical Session-4 : Interpretation of Different Parametric and Non Parametric Statistics and Their Importance in Research
5. Technical Session-5 : Scientific Management Styles of Referencing
6. Technical Session-6 : Measurement of Errors in Education Research

In the national seminar it was decided to call for full paper participation with ISBN numbers and the number of abstract submission broke all previous records for this year seminar series with over 410 submissions. The Technical Program Committee is charged with reviewing all abstracts to accommodate the growing number of paper submission. In a rigorous and time-consuming review process, the committee members worked hard to ensure the continued high quality of accepted papers.

Seminar such as these can only succeed as a team effort. Planning for this seminar has occupied several hundred of hours over six months by many dedicated people. First, I would like to thank the management of organizing committee who trusted me to organize this seminar and who contributed significant funds to support this event. Next, I would like to thank the technical program committee and the reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice. I want to express my sincere thanks to all the dedicated Team members for their active role and support in all aspects of this seminar from collecting abstracts, assisting in coordination, helping to plan the agenda, recruiting sponsors, assisting in organizing the seminar, and on and on. I cannot thank them enough for their constant support and dedication so I proud to call them Team, one of the brilliant and amazing team.

Finally, I want to express my sincere thanks to all the invited speakers, offline and online, come from the four corners of India for kindly arranging their time to participate in this seminar. It has been a great pleasure to interact with them and receiving their interest to develop collaboration in the future. It's going to be the best meeting yet.

The venue of this seminar is located in pink city, Jaipur and we have tried to promote a sense of the local culture and North-Indian cuisine to the attendees during this seminar. We hope, that this seminar is intellectually stimulating, enjoyable and memorable for all the attendees and professionally satisfying them at the historical, cultural and pink-city Jaipur.

With warmest regards,

Dr. Manish Biyani
Organizing Chair
www.biyaniseminar.com

Message

We feel proud to see that the Biyani Girls B.Ed College, Jaipur is organizing a national seminar on "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research" On April 14 – 15 2022.

In present scenario it has been found that the quality of research output has been far from the much needed standards. The quality of research depends on the understanding of the research problem and the output. It is significantly based on the appropriate research tool and its interpretation.

So, Biyani Girls B.Ed. College takes the initiative tp organize a national workshop on "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research".

This seminar will provide an ample opportunity to all the resource persons, guest speakers and delegates to interact with each other and ponder over vital issues related to education and social research.

I hope, all the participants will enjoy not only the different technical session of the seminar, but also gain valuable tips for developing personality and inculcate values.

We wish the seminar a great success.

" The great use of education is not merely to collect facts, but to know man and to make one self known to man, it is the duty of every human being to master, not only the language of intellect, but also that of personality" – (Ravindra Nath Tagore.)

Dr. Rajeev Biyani
Chairman
Biyani Group of Colleges

Dr. Sanjay Biyani
Director (Acad.)
Biyani Group of Colleges

Message

With great pleasure to know that Biyani Girls B.Ed. College is being organized a national Seminar entitled "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research" On April 14 – 15 2022.

The intent of the seminar is to propel the leaner from individual to collective transformation, towards achieving substantive citizenship.

I wish for the great success of this grand event.

Ms. Priyanka Biyani
Asst. Director
Biyani Girls B.Ed. College
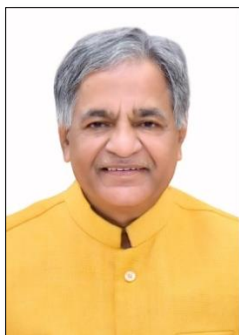
Prof. P.C. Trivedi
Former VC of JNVU, Jodhpur

Message

I'm extremely delighted and privileged to be invited in the Biyani national seminar sponsored by ICSSR "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research" On April 14 – 15 2022.

I'm glad to know that this seminar will bring together several distinguished educationist from all over the India. I hope that the interaction and deliberation among the academic communities of India and aboard at the seminar will generate constitute recommendations.

I convey my best wishes for the success of conference to Biyani Girls B.Ed. College.

Prof. P.C. Trivedi
Former VC of JNVU, Jodhpur
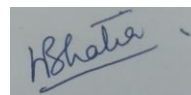
Ms. Harjeet Kaur Bhatia
ProfessorDepartment of Educational Studies
Jamia Millia Islamia

Message

It gives me immense pleasure to learn that Biyani Girls B.Ed. College, Sector-3, Vidhyadhar Nagar, Jaipur Rajasthan is organizing ICSSR Sponsored National Seminar entitled 'Methods of Measuring and Interpretation of Outcomes in Educational and Social Research' on APRIL 14-15, 2022.

I am delighted to know that several distinguished participants from all over the world will share the knowledge and identify issues related to the topic.

I extend my heartiest congratulations to Biyani Girls B.Ed. College for this initiative and also take this opportunity to wish the event a grand success.

Ms. Harjeet Kaur Bhatia
ProfessorDepartment of Educational Studies
Jamia Millia Islamia

Prof. K. C. Vashistha
Professor,
Department of Foundation of Education,
Dayalbagh Educational Institute, Agra

Message

I'm extremely delighted and privileged to be invited in the Biyani national seminar sponsored by ICSSR "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research" On April 14 – 15 2022.

I'm glad to know that this seminar will bring together several distinguished educationist from all over the India. I convey my best wishes for the success of conference to Biyani Girls B.Ed. College.

Prof. K. C. Vashistha
Professor

Dr. Devika Agarwal
Hod Com. & Management,
Biyani Group of College, Jaipur
Pdf Scholar, ICSSR, New Delhi

Message

To solve any problem it is importany to get the result through scientific research. However, most important is the process and methodology aspected in getting the results. It gives me immense pleasure to be a part of 13th Biyani national seminar on **"Methods of Measuring and Interpretation of Outcomes in Educational and Social Research"** On April 14 – 15 2022.

I'm sure that this seminar will provide adequate opportunity for all the participants to share their knowledge and deliberate on currents issues related to the subjects.
I whole heartedly congratulate the organize and wish them the very best for the success of the seminar.

Dr. Devika Agarwal

Dr. Deepak Gupta
Data Analysist & Statistician,
C.E.O. CDART Pvt. Ltd.

Message

May this conference be characterized by fruitful though provoking discussion, which will lead to the betterment of our society. Kudos to the conveneior and her entire team for their sincere efforts. My best wishes for its grand success.

I wish all the best to all the participants and presenters to be the part of this national seminar.

Dr. Deepak Gupta

Prof. Anjali Sharma
Head, Department of Education,
Central University, Kishangarh University, Rajasthan

Message

I am happy to learn that the Biyani Girls B.Ed. College, Jaipur is organizing an ICSSR sponsored 13th Biyani national seminar on the "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research" On April 14 – 15 2022 and that the proceedings will be published on this occasion. I'm sure such a seminar will provide an opportunity to the distinguished delegates from India and abroad to deliberate upon theme in a wider perspective.

I send my best wishes on this occasion.

Prof. Anjali Sharma

Dr. Sampark Acharya

Asst. Prof. Rajasthan Shikshak Mahavidhyalya, Jaipur

Message

The Biyani Girls B.Ed. College is organizing an ICSSR sponsored national seminar on method of measuring and Interpretation of outcomes in educational and social research. I am sure that this seminar will assure a smooth flow of information, encourage passionate dialogue and active engagement, enhancing researchers' skill and knowledge of researchers in the field of educational as well as social researches. This seminar will definitely improve the confidence among the individual. By learning about new topics and meeting their thrust area of research, the researchers will feel encouraged and motivated. Many prominent professors and personalities are visiting this seminar to deliver their knowledge among the listeners, this will help the listeners to gain information about their way of work or how things take place in research. My good wishes to organizers.

Thanks and regards,

Dr. Sampark Acharya

FROM THE CONVENER DESK

I have immense pleasure to present the souvenir released as planned, coinciding with the Inational Seminar "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research" On April 14 – 15 2022. The Souvenir is also an effort to transmit the knowledge of quality assessment process in education to all.

The theme of the current year's seminar is "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research".

Facts become knowledge, when it is used in the successful completion of a decision process. In research massive amount of facts are integrated as knowledge. Usefulness and utility of research outcomes lies in proper interpretation. Thus interpretation is a basic component of research. It is a device through which the factors that seen to explain what has been observed by researcher in course of study can be better understood.

Through this seminar we will discuss concept and ethics of developing a research tool and process of construction of standardize tool.

The organization of this national Seminar at Biyani Girls B. Ed. College, Jaipur could not have been possible without assiduous support of faculty members of the college on one hand and on the other non -teaching staff/students of the college. We are also thankful to all those who have directly or indirectly helped us in organizing the seminar. It is an outcome of the hard work and persistent efforts of all our colleagues. The patronage extended from the management too has played a very important role in organizing the programme.

Dr. Ekta Pareek
(Dept. of Education)
Convener

Dr. Shipra Gupta
(Dept. of Education)
Co-ordinator

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PROGRAMME AT GLANCE

Biyani Girls B.Ed. College, Jaipur
Schedule of the National Seminar sponsored by ICSSR
"Method of Measuring and Interpretation of Outcomes in Educational and Social Research"
Day 1
April, 14, 2022 (Thursday)

07:30- 08:00	Registration
08:00- 08:05	Lighting of the lamp and Ganesh Vandana
08:05- 08:15	Opening and Welcome Remark: **Prof. Manish Biyani**, Professor, JAIST University Japan.
08:15 -08:30	Address by Chief Guest: **Prof. P.C. Trivedi** ,former VC (JNVU, Jodhpur)
08:30-08:40	Presentation on Forgotten Heroes : Stories of Unsung Heroes, Freedom Fighters to celebrate "**Azadi Ka Amrit Mahotsav**"
08:40-09:00	Special Lecturer : **Prof. Sanjay Biyani,** Director, Biyani Group of Colleges, Jaipur
Technical Session I Concept and Ethics of developing a research tool	
09:00- 10:00	Invited lecture -1 : **Dr. Harjeet Kaur Bhatia,** Professor, Department of Educational Studies , Jamia Millia Islamia Central University, Delhi
10:00-10:30	Refreshment
Technical Session II : Introduction of different types of data collection instruments	
10:30-11:30	Invited lecture- 2: **Prof. K. C. Vashistha ,** Professor**,** Department of Foundations of Education, Dayalbagh Educational Institute. Agara
Technical Session III: Process of construction of standardize tool: validity, reliability, objectivity, item analysis.	
11:30-12:30	Invited Lecture- 3: **Dr Devika Agarwal, HOD Com. & Management, Biyani Group of college, Jaipur . PDF Scholar, ICSSR, New Delhi**
12:30- 01:20	Oral Presentation
01:20- 01:25	Vote of Thanks By Dr. Ekta Pareek ,Principal, BGBC

Day 2

April, 15, 2022 (Friday)

08:00- 08:10	Lighting of the lamp and Saraswati Vandana
08:10- 08:30	Presentation on **Atamnirbhar Bharat** to celebrate "**Azadi Ka Amrit Mahotsav**
Technical Session IV: Interpretation of different Parametric and Non-Parametric Statistics and their importance in research.	
08:30- 09:30	**Invited lecture -1 Dr. Deepak Kumar Gupta, Data Analyst & Statistician, C.E.O. CDART Pvt. Ltd**.
Technical Session V: Scientific Management Styles of Referencing	
09:30-10:30	Invited lecture 2 **Prof. Anjali Sharma**, Head, Department of Education, Central University, Kishangarh, Rajasthan
10:30-11:00	Refreshment
Technical Session IV: Measurement of Errors in Education Research	
11:00-12:00	Invited Lecture -3: Dr **Sampark Acharya, Asst. Prof. Rajasthan Shikshak Mahavidhylya, Jaipur**
12:00-1:00	Paper Presentation
01:00 -1:30	Vote Of Thanks and closing session

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Contributed Paper:

- **List of Paper Presenters:**

A. Day 1

❖ Dr. Anupama Goyal

❖ Mr. Naveen Kumar Pareek

❖ Ms. Rajani Upadhyay

B. **Day 2**

- Dr. Barkha Rani

- Mr. Vrijesh Kumar Pareek

- Ms. Rekha Chopra

- Ms. Sweety Acharya, Dr. Sampark Acharya

Data Collecting Instruments and Tools In Research

Dr. Anupama Goyal

Associate Professor in Botany

Maharani Girls College, Ajmer Road, Jaipur

Abstract

Data collection is the process of collecting and measuring information about variables of interest, in a systematic way that enables one to answer stated research questions, test ideas, and evaluate results. The research component of data collection is common in all fields of study including environmental and social sciences, humanities, business, etc. Although methods vary from instruction, emphasis is placed on ensuring accurate and reliable collection. The goal of all data collection is to capture quality evidence that also translates into rich data analysis and allows for the creation of a convincing and reliable answer to the questions asked. Regardless of the research field or preference in interpreting data (quantity, quality), accurate data collection is essential to maintaining research integrity. Both the selection of appropriate data collection tools (existing, modified, or newly developed) and explicit instructions for its use should reduce the likelihood of errors occurring. Depending on the type of data required the researcher should decide which tool will be suitable under circumtances..Other tools help to obtain descriptive / quality data and to obtain quantitative data.

Data collection is one of the most important stages of research. You can have the best research design in the world but if you can't collect the required data you will not be able to complete your project. Data collection is a very difficult task that requires careful planning, hard work, patience, perseverance and so on in order to complete the task successfully. Data collection begins with determining what type of data is required followed by sample selection for specific individuals. After that, you need to use a specific tool to collect data from the selected sample.

Introduction:

Types of data collection

Data collection alone falls under two broad categories; Basic data collection and secondary data collection.

- **Primary Data Collection**

Primary data collection is raw data collection collected from source. It is a process of collecting original data collected by a researcher for a specific research purpose. It can also be broken down into two parts; qualitative research and quantitative data collection methods.

• **Qualitative Research Method**

Advanced research methods for data collection do not involve data collection involving numbers or the need for statistical discovery, rather they are based on measurable factors such as the researcher's feelings or emotions. An example of such a method is an open-ended questionnaire.

- **Quantitative Research Method**

Quantitative methods are presented in numbers and require statistical calculations. An example would be the use of a questionnaire with close-ended questions to arrive at figures to be mathematically calculated. It also includes methods of correlation and regression, mean , mode and median.
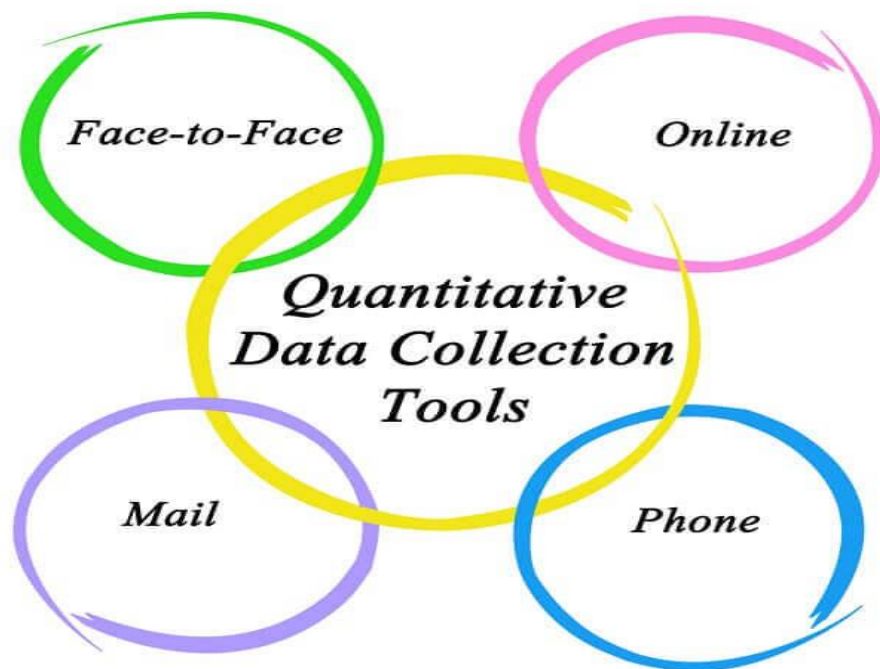
Secondary Data Collection

Secondary data collection, is the gathering of second-hand data collected by an individual who is not the original user.. It is a process of collecting existing data, be it already published books, journals, and / or Internet sites. In terms of simplicity, it is much less expensive and easier to assemble.

Your choice between Basic data collection and secondary data collection depends on the type, scope, and location of your research and its objectives and objectives.

IMPORTANCE DATA COLLECTION

There are a number of basic reasons for data collection, especially for the researcher. Going with you to them, here are a few reasons;

• Research Integrity

The main reason for collecting data, either in quantity or quality, is to ensure that the integrity of the research question is maintained.

• Reduce the risk of errors

Proper use of appropriate method data collection reduces the errors consistent with the results.

•   Decision making

To reduce the risk of errors in decision-making, it is important that accurate data is collected so that the researcher does not make uninformed decisions.

• Save Cost and Time

Data collection saves the researcher's time and resources that could have been misused without a deep understanding of the topic or topic.

• Support the need for new ideas, innovations, and / or innovations

To prove the need for change in the norm or the introduction of new information that will be widely accepted, it is important to collect data as evidence to support these claims.

What Is a Data Collection Tool?

Data collection tools are the devices or instruments used to collect data, such as paper questionnaires or computer-assisted interviews. Examples, Checklists, Interviews, Occasional Checks, and Surveys or Questionnaires are all tools used to collect data.

It is important to determine the data collection tools because the research is done in different ways and for different purposes. The purpose of data collection is to capture quality evidence that allows analysis to lead to the creation of convincing and reliable answers to the questions asked.

INTERVIEW

An interview is a face-to-face conversation between two people for the sole purpose of gathering information that is relevant to the purpose of the research. Interviews are of various types namely; Structured, Slightly formed, and irregular and each slightly different from the other.

• Structured Interviews-. It is a verbally administered questionnaire, For speed and efficiency, it is highly recommended, but it has no depth.

- Semi-Structured Interviews:

  In this method, there subsist several key questions which cover the scope of the areas to be explored. It allows a little more leeway for the researcher to explore the subject matter.

• Unstructured Interviews: It is an in-depth discussion that allows the researcher to gather more information on purpose. The advantage of this approach is the freedom that gives the researcher the ability to integrate structure and flexibility, although it is time-consuming.

Benefits

- In-depth information

- Freedom of flexibility

- Accurate data.

Cons

• Time consuming

• It is expensive to collect.

What Are The Best Database Collection Tools?

To collect data about conversations, here are a few tools you can use to collect data easily.

• Sound recorder

Audio recorder is used to record sound on disk, tape, or film. Audio information can meet the needs of a wide range of people, and provide alternative printing tools for data collection tools.

• Digital camera

The advantage of a digital camera is that it can be used to transfer those images to the monitoring screen when the need arises.

• Camera

A camcorder is used for collecting data through interviews. It provides a combination of both an audio recorder and a video camera. The data provided is standard and allows respondents to answer fully asked questions. If you need to gather sensitive information during the interview, the camera lens may not work for you as you will need to maintain the privacy of your subject.

Questionnaires

This is a process of data collection with a tool that includes a series of questions and instructions for getting feedback from the target audience. The questionnaire is designed to collect data from the group.

To be clear, it is important to note that the questionnaire is not research, but rather part of it. A survey is a data collection process that involves a variety of data collection methods, including a list of questions.

In the questionnaire, there are three types of questions used. That's right; unique, scale, and open. For each question related to the nature and scope of the study.

Pros:

 It can be controlled in large quantities and is economical.

• Can be used to compare and contrast previous research to measure change.

• It is easy to visualize and analyze.

• The questionnaire provides actionable data.

• The identity of the respondent is protected.

• The questionnaire can cover all areas of the topic.

• Inexpensive.

Cons:

• Responses may be unreliable or respondents lose interest in the middle.

• The questionnaire cannot generate quality data.

• Questions may be left unanswered.

• Respondents may have a hidden agenda.

• Not all questions can be easily analyzed.

What Are The Best Database Collection Tools?

• Formplus Online Questionnaire

Formplus allows you to create powerful forms to help you gather the information you need. Formplus helps you create your favorite online forms. Formplus online questionnaire form template for possible trends and measurable answers. Do research, improve your product knowledge or already know the audience with this form template. The form template is fast, free and customizable.

Paper Questionnaire

A Paper questionnaire is a data collection tool that includes a series of questions or instructions for the purpose of collecting information from respondents. It is highly designed for statistical analysis of responses, and can be used as a data collection method.

REPORTING

By definition, data reporting is the process of collecting and transmitting data that will be further analyzed. An important aspect of data reporting is to report accurate data because inaccurate data reporting often leads to uninformed decision-making.

Pros:

• You make informed decisions.

• Easy to access.

Cons:

• The answers you have given may be exaggerated.

• Consequences may be affected by bias.

• Respondents may be too shy to provide all the details.

• Incorrect reports will lead to uninformed decisions.

What Are the Best Tools for Data Reporting?

Reporting tools allow you to extract and present data on charts, tables, and other visuals so users can find useful information. You can find reporting data on non-governmental organizations (NGOs) reports, newspapers, website articles, hospital records.

• NGO reports

The content of the NGO reports is an in-depth and comprehensive report on the activities of the NGO, covering areas such as business and human rights. The information contained in these reports is directly related to the research and forms an acceptable educational basis for data collection. NGOs tend to focus on development programs designed to promote specific causes.

• Newspapers

Newspaper data is easy to collect and is sometimes the only continuous source of event data. Although there is a problem with newspaper bias, it is still a valid tool for collecting Reporting data.

• Website Documents

Collecting and using the data contained in website articles is also another data collection tool. Collecting data on web topics is a fast and inexpensive data collection The two biggest disadvantages of using this data reporting method are bias in the data collection process and potential concerns for security / confidentiality.

• Hospital Care Records

Healthcare includes a wide range of public and private data collection systems, including health surveys, administrative registration and payment records, and medical records, used by various organizations, including hospitals, CHCs, physicians, and health systems. The data provided is clear, impartial and accurate, but should be obtained under legal means as medical data is maintained with strict rules.

EXISTIONG DATA

This is an introduction to new research questions in addition to those previously used when data was initially collected. It involves adding dimensions to a study or study. An example would be retrieving data from an archive.

Benefits

• Accuracy is very high.

• Easily accessible information.

• Problems with testing.

• Difficulty understanding.

Which Data Collection Is Best

• Research Journals - Unlike newspapers and magazines, research journals are intended for academic or technical audiences, not ordinary students. A journal is a scholarly publication containing articles written by researchers, scholars, and other experts.

• Surveys - A survey is a data collection tool for collecting information from a sample of people, with the aim of making the results better for more people. Assessment has different purposes and can be done in many ways depending on the goals to be achieved.

OBSERVATION

This is a method of data collection where the information of an object is collected by observation. View mode can be achieved as a full viewer, viewer as participant, participant as viewer, or as full participant. This approach is the basic basis for hypothesis.

Benefits

• Easy to handle.

• There is great accuracy in the results.

• It is a universally accepted practice.

• Distributes respondents' reluctance to manage the report.

• Suitable for specific situations.

• Some events are not open to view.

• Reliable.

• Bias may arise.

• It is expensive to manage.

• Its validity cannot be accurately predicted.

What are the Best Viewing Data Collection Tools?

Viewing involves the active acquisition of information from a primary source. Viewing may also involve seeing and recording data using scientific tools. The best Viewing Tools are:

• Checklists - specific conditions, which allow users to gather information and make decisions about what they should know about the results. They provide systematic ways to collect data about specific behaviors, knowledge, and skills.

• Direct observation - This is a test method for collecting test information. The examiner views the subject in its normal location without changing that location.

FOCUS GROUPS

In contrast to quantitative research that includes numerical data, this method of data collection focuses on quality research. It falls under the main category of data based on respondents' opinions and opinions. This study involves asking open-ended questions to a group of people typically ranging from 6-10 people, to provide feedback.

Benefits

• The information obtained is usually more detailed.

• Expensive compared to one-on-one interviews.

• Demonstrates speed and efficiency in delivering results.

• Lack of depth in compiling nitty-gritty theme.

• Impartiality may be evident.

• Requires questionnaire training

• The researcher has very little control over the outcome.

• A few loud words may make others unintelligible.

• Difficulty grouping together.

What Are The Best Focused Group Data Collection Tools?

The focus group is a simplified method of data collection and built around a questionnaire. The purpose of the meeting is to draw out the participants' detailed answers to these questions. The best tools for dealing with Focus teams are:

• The Two Ways - One party looks at the other party answering questions asked by the president. After listening to what the other group has to offer, the listening group is able to handle more discussion and can reach different conclusions.

• Dueling-Moderator - There are two presidents who play the devil's lawyer. The main advantage of a cohesive presidential focus group is to facilitate new ideas by introducing new ways of thinking and diverse ideas.

INTEGRATED RESEARCH

This method of data collection involves the use of new methods to improve participation in both individuals and groups. And under the main category, it is a combination of Discussions and Focus Groups while quality data is collected. This approach is important when it comes to sensitive topics.

Benefits

• Encourage participants to provide feedback.

• Stimulates deep communication between participants.

• Respondent-related anonymity increases participation.

• Improves the richness of collected data.

• Expensive for all 7 tops.

• They are the most time consuming.

What Are the Best Integrated Research Data Collection Tools?

The Integrated Research Method involves two or more data collection methods, for example, interviews and questions or a combination of informal telephone conversations and focus groups. The best tools for integrated research are:

• Internet Research - The two tools included here are online discussions and the use of questions. This is a list of questions a target audience can fill out online. It is timely, efficient and effective. Especially since the data to be collected is volume in nature.

• Dual-Moderator - Two tools are integrated into focus groups and a structured questionnaire. Organized interviewers provided direction on where the research was headed while two presidents were in charge of the process. While one ensures that the focus group session continues smoothly, the other ensures that the topics discussed are all integrated. Dual presidential focus groups often lead to a more productive session and basically lead to complete data collection.

Conclusion:

They **provide highly detailed information about natural processes**. The data collection is laborious and time-consuming and may have to be repeated to ensure reliability. However, observation schedules based on a set of expectations can make data collection easier.

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Development of Research Tool for measuring the Effectiveness of Blended Learning among the Students.

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Abstract

The tool plays an important role in any type of research. It is with the help of tools that the researcher collects the data required for his/her research. Therefore, selection of an appropriate tool which can help in proper collection of data for any particular research is very important. The present paper focuses on the selection of an appropriate tool for the collection of data. The researcher wants to measure the effectiveness of Blended learning among the students of class VII and for this purpose experimental method of research was selected. For the collection of data, the most appropriate tool was Achievement test for students and this tool was implemented before and after the experiment. This helped the researcher in collecting the data and measuring the effectiveness of the Blended learning.

Key words -Blended Learning, effectiveness, achievement.

Introduction

There are various types of researches. For different stream the method of research is different. In other words, we can say that for different purpose research is carried in different ways. Nearly all types of researches deal with collection of data and their interpretation before coming to any conclusion. And for the collection of data the need of an appropriate tool is always there. Therefore, the researcher must select the research tool by keeping in mind the objectives of his research. Tests are the tools of measurement which guides the researcher in collection of data and also in their analysis. Although the tools differ in their complexity, design and administration but every tool is suitable for the collection of a particular type of information. The selection of proper and appropriate tool for research depends upon the researcher. Sometimes the available tools do not fulfill the certain requirement of the research and in that case the researcher opts to construct his own tool for research. There is a particular process of development of any tool for research. The present paper deals with the development of Achievement test for measuring the effectiveness of Blended learning among the students.

Blended Learning

Education is an integral part of our life and with time change in the education system is also visible. The present era is of digital revolution and this has touched our education system also. The digital resources are being used in providing education to our children. In present time the use of digital technology along with the face-to-face interaction with teacher is also seen. This type of instructional system is known as Blended learning method. Basically, Blended learning method is a combination of traditional face-to-face instructions with the use of digital technology while the students are present in the classroom. This

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type of learning has the merits of both the traditional and the online learning. The physical presence of the teacher provides moral support to the students. The teacher motivates the students and also clears their doubts and at the same time the students are also introduced with digital resources to get additional knowledge about their content. In this system the students are free to learn according to their own pace and convenience. The physical presence of teacher keeps the students focus on their aim and also provides them necessary instructions needed from time to time.

Research Tools

Research tools are the devices which are used by the researcher to collect data necessary for his/her research. The proper selection of a tool is very critical for the success of any work. An appropriate and correct tool is like a paddle which takes the boat of research to its right destination. The tools are necessary for collection of data and the main objective of data collection is to collect quality evidence to find credible answer to the research questions. The tools are basically testing devices which helps in measuring the given situation. Such tools can be a questionnaire, interview etc. They help in accomplishing a task taken by the researcher. The tools are generally developed by keeping in mind the research question, the information which is to be collected and the size of the sample. The present paper aims at developing a research tool which will be appropriate for measuring the effectiveness of Blended learning among the students. The experimental research method was used for the research. For the collection of data achievement test was developed. Pre-test and post-test application of achievement test was done to measure the effectiveness of Blended learning.

Achievement test

Achievement test measures how much a student has learned over time. These test measures how much a student has learned by analyzing his present performance. Achievement test can be regarded as the most appropriate test to measure and analyze the academic performance of a learner. Here the researcher aims to find out the effectiveness of Blended learning method on the performance of the students so achievement test is selected as a tool for collection of data.

Introduction of the Tool

Achievement test for class VII

The achievement test was constructed to find out the achievement level of the students after they were taught using Blended learning method. The test was prepared for the students of class VII. The test included three units of class VII RBSE S.St. course book. The units which are covered in the test were-Democracy and equality, State Government and Media and Democracy. The objectives of knowledge, understanding and application were given weightage. In the initial draft there were 70 questions which after seeking the advice and reviews of experts were reduced to 40. The final achievement test consisted of 40 questions. All the questions were objective types and carry equal weightage of marks. There was no negative marking foe wrong answer.

Construction of the Achievement test

The major steps which are involved in the construction of an achievement test are-

a) Preparing the design of the test
b) Writing of items
c) Writing of the scoring key
d) Question wise analysis

Preparing the design of the test

The researcher decided the objectives of the test, marks and the time which is to be employed. After making all these planning the design of the test was prepared. There are some important points that should be kept in mind while designing the test like weightage to objectives, content and form of questions. Weightage of objectives include the marks which are given according to the objectives. Objectives like knowledge, comprehension, application, skill etc. are considered while preparing the test. The questions in the test are formed keeping in mind these objectives. The weightage of content refers towards the different aspects of the content which is to be tested. The weightage given to different sections of the content comes under this category. The weightage to forms of questions indicates the different forms of questions which are included in the test. In a test different types of questions like objective type, short answer type, essay type can be used.

Writing of the item

The items were selected keeping in mind the design of the test. The number of questions to be included is decided and this is also checked that these questions can be answered in the given time period.

Writing the scoring key

The scoring key for the test was prepared. The questions prepared by the researcher were objective type and all the questions carry equal marks.

Question wise analysis

The question wise analysis of the test was done. Analysis was done keeping in consideration the content, objectives, form of questions, difficulty level, marks and estimated time.

Reliability and validity of the tool

a) Reliability
Reliability refers to the consistency of results. If consistency of result is maintained when they are obtained using the same method under similar condition than the measurement is regarded reliable. Reliability is considered as one of the major characteristics of a test. When any test is prepared its reliability is found out. There are many methods like test-retest, split half method to find out the reliability of the test. The researcher used the KR_{20} formula to find the reliability of the test. The KR_{20} (Kuder Richardson 20) formula is applied when the test has dichotomous items i.e., right and wrong answers. The question of the test carries equal weightage of marks. For every correct answer 1 mark

was given and for every wrong answer 0 marks were provided. The test consisted of 40 questions. For finding the reliability of the test a pilot study was conducted on 10 students.

b) Validity

Establishing the validity of tool is also a very important step in the standardization of the tool. Validity refers that how well a test or technique measures what they are supposed to measure. An achievement test was prepared by the researcher. The test contained the units of class VII S.St. textbook of RBSE board. The test was constructed keeping in mind the objectives like knowledge, comprehension and application. The initial draft of the test consisted of 70 questions. The test was sent to different educationalists and subject experts for determining content validity. After receiving the reviews, suggestions and instructions by the experts the question formation and their language was modified. Finally, the test included 40 questions.

Administration of the tool

After the standardization of the test, it was implemented on the students. For the research purpose experimental method was selected. The test was implemented on the students before the experiment. After the implementation of test students were given treatment. The achievement test was again implemented on the students after the completion of the treatment. The data was collected by using the test. After the collection of data, it was analyzed and the result was drawn. The pre and post test showed the change in the performance of the students when they were taught using Blended learning method. Therefore, in this type of research the achievement test played major role in determining the effectiveness of Blended learning method.

Conclusion

The tools are the lighthouse which shows the correct direction to the researcher. The right selection of tool makes the work of the research easy and the wrong selection of tool makes it impossible to conclude the work correctly. Therefore, at the time of tool selection all the necessary points should be kept in mind and a proper and appropriate tool should be selected for the research topic.

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Limitations Involved in a Two-Sample Independent t-Test

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Abstract-

While looking at obscures populace means for two groups on a specific variable, at times it is difficult to investigate the data and it brings about the error of information. There are a few limitations to utilizing a two-sample independent t-test. In this article, these limitations have been examined.

Introduction-

The two-sample t-test, otherwise called the independent sample t-test, is a strategy used to test whether the obscure populace mean for two groups on a specific variable are equivalent or not (Kim, 2015). It is additionally known to break down assuming there is any distinction between the mean scores of two groups on a specific variable is significant or not (Chiang, 2015). A two-sample t-test is equivalent to we use to investigate the outcomes from the A/B test (Xu, Fralick, Zheng, Wang, Tu, & Feng, 2017). The independent t-test is utilized when the information values are independent; randomly chosen from two normally distributed populations and the two independent groups have equal variance. In the event that the variance isn't equivalent, it is called to be utilizing an alternate test of the standard deviation (Moore, Notz, & Flinger, 2013). In some cases the researchers have multiple groups to compare and they use to compare them individually with break down information for example group A v/s group B, Group A v/s Group C, and Group B v/s Group C. Yet, it's anything but a decent practice for utilizing t-test. The researchers, experiencing the same thing, should use Analysis of Variance (ANOVA), Tukey-Kramer test (TKT), Analysis of Means (ANOM) to compare group means to the overall mean or they can utilize Dunnett's test to compare each group mean to a control mean (Lee & Lee, 2018). There are a few assumptions of the t-test which incorporate-

Assumptions of t-test-

1. **The scale of measurement-** The assumption for a t-test is that the scale of measurement applied to the information collected follows a continuous or ordinal scale, such as the scores for an aptitude test. (Boateng, Neilands, Frongillo, Melgar-Quiñonez, & Young, 2018)

2. **Independence-** Data in each group ought to be randomly and independently sampled from the populace. (Kim, 2015)

3. **Random Sampling-** The information is gathered from a representative, randomly chosen portion of the entire populace. (Banerjee & Chaudhury, 2010)

4. **Normal distribution-** The information gathered from the sample should be normally distributed and can be seen on NPC. (Ghasemi & Zahediasl, 2012)

5. **Equal variance-** The two populaces ought to have the same variance. This can be adjusted through. (Kim, 2015)

6. **No outliers-** There ought to be no outliers in the information collected from the independent samples. (Kwak & Kim, 2017)

The above presumptions are applied in practically all parametric factual methods. These suppositions are obeyed by each researcher who is utilizing an independent t-test as they are valid or as sure to occur without evidence. As these suppositions are called to be followed, these are likewise called limits of independent t-test as under-

Limitations of t-Test-

1. **Limitations concerning the scale of measurement-** Scales of measurement are the way variables are characterized and ordered (Mishra, Pandey, Singh, & Gupta, 2018). There are four common scales of measurement in social research. For example nominal, ordinal, interval, and ratio. Each scale of measurement has properties that decide how to dissect the information appropriately (Mishra, Pandey, Singh, & Gupta, 2018). In the t-test, numerous impediments are concerning the measurement tool. The measurement ought to be based on certain properties as-

- **Identity-** Any measurement through a tool must have an identity. It refers to each value having a unique meaning. In the t-test, the mean scores of collected data are analyzed. It is very hard to identify the uniqueness of the scores of every subject from which the data were collected. If few of them score the highest marks, then the whole group seems to have good scores based on mean scores. (Dahiru, 2008)

- **Magnitude-** The magnitude in measurement implies that values are in an arranged relationship to each other, so there is a specific order to the variables. However, in the t-test, the values are not really in an arranged structure. (Kaliyadan & Kulkarni, 2019)

- **Equal Interval-** In any good measurement, the informative elements or the data-points along the scale ought to be equivalent. This is called equivalent spans between the relevant informative elements. For this situation, the information point first and second will have similar interval as the information point third and fourth have. Be that as it may, it isn't seen when we utilize the t-test. In the t-test as referenced above, we utilize mean scores and dissect something very similar to decipher. We can't analyze each data point and they may fundamentally vary from the previous or next element or the average value of the whole group. (Banerjee & Chaudhury, 2010)

- **Minimum value zero-** In every measurement, the scale ought to begin from nothing or 'zero', however in t-test, generally Likert type scales are utilized and in these scales, the minimum value isn't zero. Subsequently, appropriate and precise estimation of the qualities is absurd. (Ghasemi & Zahediasl, 2012)

2. **Limitations concerning the independence of data-** A major supposition in the t-test are that the information ought to be independent and sampled randomly. A random sample is a grouping of independent, identically distributed (IID) random variables. The term random sample is omnipresent in numerical insights while the truncation IID is similarly as common basic probability, and accordingly this part can be considered to be a scaffold between the two subjects. In educational, psychological, and social research, the researchers typically select the sample according to their convenience (Kwak & Kim, 2017). The sample seems to be random, but actually, it is taken from a selected group of subjects. The data collected in this manner is not actually from a randomly selected sample and this sample does not truly represent every part of the population. (Lee & Lee, 2018)

3. **Limitations concerning the random sampling-** When any researcher uses t-test as the inferential statistics to analyze and interpret information, he/she has to collect data from random sampling techniques. Normally simple random sampling methods are used to determine the sample for the research. This is one of the methods researchers use to choose a sample from a larger population (Dahiru, 2008). This method is also used to generalize the population. The major advantage of the random sampling is that it includes the simplicity and lack of bias but there is a big difficulty in selecting the sample randomly as it is hard to access a complete list of a larger population, time, costs, and that bias can still occur under certain circumstances. In a t-test, it is hard to remain unbiased and also have access to every subject selected through a random method. It is also hard to maintain costs and time to gather information in stipulated time. (Chiang, 2015)

4. **Limitations concerning the normal distribution-** in social, educational, and psychological research, when the researchers use a t-test, they have to confirm if the data is normally distributed or not (Banerjee & Chaudhury, 2010). For this, they either use skewness and kurtosis or build a normal distribution curve to confirm. For any researcher, it is compulsory to confirm that the data is normally distributed. Otherwise; he/she shall have to collect the data again and again unless and until the data gets normally distributed. One disadvantage of the normal distribution is that the normal distribution starts at negative infinity. This can result in negative values in some of the results. (Boateng, Neilands, Frongillo, Melgar-Quiñonez, & Young, 2018)

5. **Limitations concerning the equal variance-** The independent t-test require equal variance among data. To test a null hypothesis, the variance of information should be equal if we are using an independent t-test (Ghasemi & Zahediasl, 2012). This is an assumption that The t-test is used to test a null hypothesis that the variance is equal across the groups. But, a p-value less than 0.05 indicates a violation of this assumption (Mishra, Pandey, Singh, & Gupta, 2018). If a violator occurs, conducting the non-parametric equivalent of the analysis is likely more appropriate.

6. **Limitations concerning the no-outliers-** In any data set, outliers increase the error variance and reduce the power of statistical tests. They can cause bias or influence estimates. They can also impact the basic assumption of the t-test as well as other statistical methods. Outliers arise because of changes in system behavior, fraudulent behavior, human error, instrument error, or simply natural deviations in a certain population (Banerjee & Chaudhury, 2010). A sample may have been contaminated with elements from outside the population being examined. In social, psychological, and educational research, the researchers are not much experienced and trained to do research. They tend to fulfill the need of having a degree after their masters and to satisfy their goal of career only. When they use a t-test, they are normally biased or do not know how to remove outliers. This causes having wrong data-set and also improper analysis and incomplete interpretation of the information. (Kim, 2015)

 Discussion-

The two-sample independent t-test is normally used in social, psychological, and educational research to compare the mean scores of two groups that have equal variance. In this test, the results of the tests may be different if we do not remove errors that normally occur in data gathering. These errors occur when e do not know the limitations of using the t-test. These limitations help the researcher not be biased and be cautious while selecting the data gathering tool, selecting the sample, and using the collected data. The researcher must select the sample from an entire population that is well defined. The sample should

be randomly selected and after collecting the data, the researcher should see if the data fits in NPC or not. If not, the data should be collected again. All outliers must be removed or minimized before analyzing for interpretation.

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श्रीमति दीपमाला उपाध्याय
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साक्षात्कार : तथ्य संकलन की एक विधि के रूप में
Interview : As a method of data collection

1. प्रस्तावना –

किसी भी विज्ञान का विकास इस बात पर निर्भर होता है कि उसके अनुसंधान की विधियाँ तथा तथ्य संकलन के साधन कितने विकसित है। प्राकृतिक विज्ञानों में अनुसंधान की विधियाँ तथा उपकरण अत्यंत विकसित हो चुके है। सामाजिक विज्ञान जैसे समाजशास्त्र, राजनीतिशास्त्र, लोकप्रशासन आदि विज्ञान प्राकृतिक विज्ञानों की अपेक्षा इस क्षेत्र में काफी पीछे है।

गुडे व हाट लिखा है कि ''सामाजिक विज्ञानों की अध्ययन वस्तु मानव है। मानव स्वयं एक जटिल प्राणी है। जिसका स्वभाव निरन्तर बदलता रहता है, अध्ययन वस्तु एवं वैज्ञानिक दोनों मानव, मानव होने के कारण पक्षपात आदि की सम्भावना रहती है।

मानव में क्षमता है कि स्वयं के सम्बंध में मानव वैज्ञानिक द्वारा की गई भविष्यवाणी को गलत सिद्ध कर सके। इन सीमाओं के होते हुए भी कुछ और ऐसी विशेषताएँ है जिनकी वजह से सा. विज्ञान अनुसंधान में कुछ विशिष्ट तथ्य संकलन की पद्धतियों का प्रयोग करता है। जैसे अवलोकन, अनुसूची, प्रश्नावली, साक्षात्कार इत्यादि।

2. साक्षात्कार –

साक्षात्कार तथ्य संकलन की एक आत्मनिष्ठ विधि है। इस विधि द्वारा व्यक्ति को समस्याओं तथा गुणों का ज्ञान प्राप्त कराया जाता है। साक्षात्कार निर्देशन कार्य विधि का एक आवश्यक अंग है। यह परामर्श प्रक्रिया का हृदय माना जाता है। विद्यालयों में छात्रों के समक्ष अनेक समस्यायें उत्पन्न होती है। इन समस्याओं को समझने व उनके समाधान में छात्रों की सहायता करने के लिए साक्षात्कार महत्वपूर्ण विधि है। साक्षात्कार प्रणाली में वैज्ञानिक और उत्तरदाता दोनों आमने–सामने के सम्बंध है। साक्षात्कारकर्ता प्रश्न पूछता है तथा उत्तरदाता उनके उत्तर देता है। साक्षात्कारकर्ता का निरंतर यह प्रयास रहता है। सूचनादाता बराबर अनुसंधान की समस्या से सम्बन्धित अपने विचार व्यक्त करें।

पी. वी. यंग ने लिखा है कि :–''साक्षात्कार एक व्यवस्थित विधि मानी जा सकती है जिसके द्वारा एक व्यक्ति दूसरे व्यक्ति के आंतरिक जीवन में अधिक या कम कल्पनात्मक रूप में प्रवेश करता है जो उसके लिए सामान्यतया तुलनात्मक रूप से अपरिचित था।''

सिन पाओ यंग :–

''साक्षात्कार क्षेत्रीय कार्य की एक विधि है जिसका प्रयोग व्यक्ति या व्यक्तियों के व्यवहार को देखने कथनों को लिखने तथा सामाजिक या सामूहिक अन्तःक्रिया के वास्तविक परिणामों का निरीक्षण करने के लिए किया जाता है।''

निष्कर्षतः गुडे व हाट, हेडर व लिंडमैन और एम.एन. बसु के अनुसार साक्षात्कार पद्धति एक सामाजिक अन्तः क्रिया की प्रक्रिया है। जिसमें साक्षात्कारकर्ता और सूचनादाताओं ने परस्पर आमने–सामने के सम्बन्ध, किसी बिन्दु पर प्रश्नोत्तर करने के लिए स्थापित होते है।

3. साक्षात्कार के कार्य –

उत्तरदाता से प्राप्त जानकारी सामाजिक यथार्थ स्वभाव में अन्तदृष्टि प्रदान करती है चूंकि साक्षात्कारकर्ता कुछ समय उत्तरदाताओं के साथ व्यतीत करता है। इसलिए वह उनकी भावनाओं और दृष्टिकोण को स्पष्ट रूप से समझ सकता है जहां कहीं आवश्यक हो आवश्यक जानकारी प्राप्त कर सकता है।

साक्षात्कार समस्या के अज्ञात आयामों में अन्तर्दृष्टि प्रदान करता है। ससुराल पक्ष तथा कार्यालय के सहयोगियों के द्वारा विधवाओं के शोषण की समस्या में पीड़ितों के साथ व्यक्तिगत साक्षात्कार ही साक्षात्कारकर्ता को यह जानने में मदद करता है कि सहायता व्यवस्था में विधवाओं की स्थिति क्या है? वह परम्परागत मूल्यों में कितनी बँधी रहती है। जिनसे उनका जीवन दुःखी होता है और समायोजन कठिन। साक्षात्कार अध्ययन के लिए नवीन चरों को पहचानने तथा अवधारणात्मक स्पष्टता को निखारने के लिए प्रभावी अन्वेषणात्मक विधि सिद्ध हो सकता है। परीक्षण के लिए नवीन प्राकल्पनाओं पर भी विचार हो सकता है।

उदाहरणार्थ –

अर्न्तजातीय व अन्तर्सामुदायिक विवाह में पतियों व पत्नियाँ सामने आने वाली समस्याओं के अध्ययन में उनकी अभिवृत्तियों, विश्वासों और व्यवहार के स्वरूपों को काफी गहराई में खोजने पर समायोजन के विविध पक्षों के विषय में रोचक जानकारी का पता लग सकता है।

4. साक्षात्कार के प्रकार –

साक्षात्कार कई प्रकार के होते है जो संरचना, साक्षात्कार की भूमिका, साक्षात्कार में शामिल उत्तरदाताओं की संख्या आदि के संदर्भ में एक–दूसरे से भिन्न होते है। कुछ प्रकार के साक्षात्कार गुणवत्तात्मक व परिमाणात्मक दोनों प्रकार के अनुसंधानों में प्रयोग होते है।

1	2	3	4	5	6	7	8
संरचित बनाम असंरचित	मानकीकृत बनाम अमानकीकृत	वैयक्तिक बनाम समूह	स्वयं प्रबन्धित बनाम अन्य के द्वारा प्रबन्धित	अकेला बनाम पेनल	नरम बनाम कठोर	वैयक्तिक बनाम निर्वैयक्तिक	अन्य 1. केन्द्रित 2. दूरभाष 3. कम्प्यूटर द्वारा

(i) संरचित बनाम असंरचित –

असंरचित साक्षात्कार में प्रश्नों की शब्दावली में कोई विशिष्टताएँ नहीं होती है और ना ही प्रश्नों के क्रम में। साक्षात्कारकर्ता जब और जैसे प्रश्नों की आवश्यकता होती है वैसा बना लेता है। मार्गदर्शन के रूप में प्रस्तुत किये जाने के कारण इन साक्षात्कारों की बनावट लचीली होती है। सरल शब्दों में

इस साक्षात्कार में सासक्षात्कारकर्ता के पास 1. मस्तिष्क में सामान्य प्रश्न ही होते है 2. विशेष मुद्दों के कोई विशेष पूर्व संकेत नहीं होते, जिन पर प्रश्न पूछे जाने है 3. किसी खास तरीके के प्रश्नों का क्रम नहीं होता, जिन पर प्रश्न पूछे जाने है। 4. साक्षात्कार जारी रखने की कोई समय सीमा नहीं होता। इस प्रकार जो कुछ एक उत्तरदाता से प्रारम्भ में पूछा गया है वह दूसरे से अन्त में और एक और उत्तरदाता से मध्य में पूछा जा सकता है।

इस प्रकार के असंरचित साक्षात्कार के लाभ है– 1. चूँकि प्रश्न लगातार पूछे जाते है इसलिए साक्षात्कार वार्तालाप के रूप में चलाया जा सकता है 2. अप्रतिबन्धित तरीके से अन्वेषण की अधिक सम्भावनाएँ हो जाती है 3. समस्या के विशेष पहलू में उत्तरदाता की रूचि को देखकर साक्षात्कारकर्ता उसी पर ध्यान केन्द्रित कर सकता है।

(ii) संरचित साक्षात्कार –

इस प्रकार के साक्षात्कार में अध्ययन विषय से सम्बन्धित कुछ प्रश्नों का पहले से ही निर्माण कर लिया और उन्हें एक व्यवस्थित क्रम में रख लिया जाता है। साक्षात्कारकर्ता इन प्रश्नों को सूचनादाता से पूछकर जानकारी प्राप्त करता है। प्रश्नों की इस सूची को साक्षात्कार अनुसूची कहते है। वास्तव में यह साक्षात्कारकर्ता द्वारा तैयार किए गए प्रश्नों का एक समूह है। यह साक्षात्कार अपने किसी भी अवयव के साथ किसी भी प्रकार के समायोजन की अनुमति नहीं देता है। जैसे विषय सामग्री, शब्द प्रयोग या प्रश्नों का क्रम। इस प्रकार के साक्षात्कार में साक्षात्कारकर्ता से यह अपेक्षा की जाती है कि वह निरपेक्ष रहकर सभी उत्तरदाताओं को एक सा समझें। संरचित साक्षात्कार ''साक्षात्कार दिग्दर्शिका'' पर आधारित होता है।

इसका उद्देश्य यह है कि साक्षात्कारकर्ता के पूर्वाग्रह को कम से कम किया जा सकें और समस्त प्रक्रिया में अधिक से अधिक अनौपचारिकता आ सकें। इस प्रकार का साक्षात्कार परिमाणात्मक अनुसंधान में प्रयुक्त होता है।

इस साक्षात्कार में सभी आयाम अर्थात् –

- साक्षात्कार की व्यवस्था बताना
- प्रश्नों को व्यवस्थित करना
- उत्तरों की सीमा तय करना
- साक्षात्कारकर्ता और उत्तरदाता को नियंत्रित करना
- समस्या के पहलुओं के सीमांकन का नियमन हो जाता है।

(iii) मानकीकृत बनाम अमानकीकृत साक्षात्कार –

मानकीकृत साक्षात्कारों में प्रत्येक प्रश्न का उत्तर मानकीकृत होता है क्योंकि इस उद्देश्य के लिए दिए गए उत्तर वर्गों के समूह से निर्धारित होता है। उत्तरदाताओं को दिए हुए विकल्पों में से एक को उत्तर के रूप में चुनना होता है। उदाहरणार्थ हाँ / नहीं। मालूम नहीं। सहमत है अनपढ़ / कम शिक्षित / उच्च शिक्षित / पक्ष में आदि विकलप हो सकते है।

अमानकीकृत साक्षात्कार वह है जिसमें उत्तरदाताओं पर ही छोड़ दिए जाते है। यह मुख्यतः गुणवत्तात्मक अनुसंधान में प्रयोग किया जाता है।

(iv) वैयक्तिक बनाम समूह साक्षात्कार —वैयक्तिक साक्षात्कार वह है जिसमें साक्षात्कारकर्ता एक समय में एक उत्तरदाता का साक्षात्कार लेता है जबकि समूह साक्षात्कार में एक साथ कई उत्तरदाताओं का साक्षात्कार लिया जाता है। समूह छोटा हो सकता है मान लें दो व्यक्तियों का (जैसे पति व पत्नी) या समूह बड़ा हो सकता है जैसे फैक्ट्री में काम कर रहे 20 मजदूर।

(v) अकेला बनाम पेनल साक्षात्कार —

अकेला साक्षात्कार वह है जिसमें साक्षात्कारकर्ता एक ही साक्षात्कार में समूची जानकारी एकत्र करता है। यद्यपि उस पर उत्तरदाता से अतिरिक्त जानकारी एकत्र करने के लिए पुनः जाने के लिए कोई प्रतिबन्धित नहीं होता है।

पेनल साक्षात्कार में साक्षात्कारकर्ता बीच–2 में एक ही उत्तरदाता समूह से कई बार जानकारी एकत्र करता है यदि वही प्रश्न पूछे जाने के लिए समूह में भिन्न–2 उत्तरदाता शामिल किए जाते है तो इसको प्रवृति अध्ययन कहा जाता है।

(vi) नरम बनाम कठोर साक्षात्कार —

नरम साक्षात्कार में यद्यपि साक्षात्कारकर्ता की स्थिति द्वैतीयक होती है जहाँ तक आधार सामग्री संग्रह की बात है लेकिन वह उत्तरदाताओं पर दबाव डाले बिना मार्ग दर्शन करता है। यहाँ उत्तरदाता को फ्री रखा जाता है चर्चा के लिए।

कठोर साक्षात्कार में साक्षात्कार पुलिस की पूछताछ के समान होती है। साक्षात्कारकर्ता प्राप्त उत्तरों की वैधता तथा पूर्णता पर प्रश्न करता है अक्सर उत्तरदाताओं को झूंठ ना बोलने की चेतावनी दी जाती है जब वे संकोच करें तो उत्तर के लिए उन्हें बाध्य करता है।

(vii) वैयक्तिक बनाम निर्वैयक्तिक साक्षात्कार —

वैयक्तिक साक्षात्कार वह है जो साक्षात्कार में साक्षात्कारकर्ता और उत्तरदाता में आमने–सामने सम्पर्क होता है। निर्वैयक्तिक साक्षात्कार में आमने सामने के सम्बन्ध नहीं होते। लेकिन जानकारी टेलीफोन, कम्प्यूटर अथवा अन्य किसी माध्यम द्वारा एकत्र की जाती है।

(viii) अन्य प्रकार

(A) <u>केन्द्रित साक्षात्कार –</u>

यह साक्षात्कार मर्टन और उनके साथियों द्वारा प्रयुक्त व परिभाषित किया गया है। उन्होंने अपने लेख में इस पर काफी चर्चा की है। उनके अनुसार केन्द्रित साक्षात्कार का ध्यान केन्द्रित करना है। केन्द्रित साक्षात्कार वह है जो एक विशेष विषय पर केन्द्रित होता है। इसमें सभी उत्तरदाताओं को एक सा अनुभव दिया जाता है। उदाहरणार्थ, दंगे के समय उपस्थित सभी लोगों से पूछा जाता कि उस स्थिति से सम्बन्ध उनके साझा अनुभव क्या रहे है। इस प्रकार यह साक्षात्कार सहभागियों के वास्तविक अनुभवों के प्रभाव पर केन्द्रित रहता है जैसे उदाहरण – उत्तरदाताओं से विशेष फ़िल्म, विशेष पुस्तक, व्यक्तित्व, विशेष कार्यक्रम आदि पर प्रश्न पूछना।

(B) <u>टेलीफोन साक्षात्कार –</u>

पश्चिमी समाजों में इस प्रकार का साक्षात्कार सामान्य होता है लेकिन भारत में नहीं फिर भी यह अब शहरी क्षेत्रों में प्रचलित हो रहा है। समाचार पत्र, रेडियो, टी.वी., कार्मिक इस विधि को महत्वपूर्ण मामलों में आम राय जानने के लिए अधिक प्रयोग किया जाता है। जैसे बजट पर प्रतिक्रिया, चुनाव नतीजों पर राय, रसोई गैस की कीमतों में अचानक वृद्धि, शहर में साम्प्रदायिक दंगे आदि कोरोना काल में जहाँ आना–जाना व्यक्तिगत सम्पर्क स्थापित करना कठिन हो गया था। वहां यही साक्षाकार काफी उपयोगी हो गया।

भारत में साक्षात्कार का यह तरीका बहुत ज्यादा नहीं चल सकता क्योंकि यहाँ टेलीफोन धारकों की संख्या कम है, उत्तरदाता टेलीफोन साक्षात्कार में कम रूचि लेता है, टेलीफोन से प्राप्त जानकारी पर्याप्त नहीं है। इन कारणों से इसका प्रयोग अपेक्षाकृत कम किया जाता है।

(C) <u>कम्प्यूटर साक्षात्कार –</u>

यह साक्षात्कार कम्प्यूटर की सहायता से लिया जाता है। भारत में यह केवल वे ही लोग ले सकते है जिनके पास कम्प्यूटर और इंटरनेट सुविधा के साथ बहुत कम लोगों के पास कम्प्यूटर है।

4. <u>सफल साक्षात्कार के लिए शर्तें –</u>

साक्षात्कार की सफलता भी आवश्यक है अगर साक्षात्कार सफल नहीं होगा तो अध्ययन में वस्तुनिष्ठता नहीं आयेगी। साक्षात्कार विधि के द्वारा आधार सामग्री एकत्र करना सरल हो जाता है। फिर भी इसकी विश्वसनीयता और वैधता प्रमुख समस्याएँ खड़ी करती है।

सफल साक्षात्कार की शर्तें क्या होनी चाहिए। लिण्डजे गार्डनर (संग्रह 2, 1965:535–37) में तीन शर्तें बताई है।

1. पहुँच   2. समझना   3. प्रेरणा

सफल साक्षात्कार के लिए नॉडल

उत्तरदाताओं की विशेषताएँ

1. आधार सामग्री

2. प्रेरणा

साक्षात्कार के गुण

1. कुशलता

2. दक्षता

उच्च परिणाम	निम्न परिणाम		उच्च परिणाम	निम्न परिणाम
– सर्वेक्षक की पसंद – साक्षात्कारकर्ता के प्रति पंसद – अनुसंधान की प्रतिष्ठा – स्वच्छवि	– अनुसंधान के प्रति अरूचि – साक्षात्कारकर्ता के प्रति नापसंद		– प्रतिबद्धता – प्रशिक्षण – ईमानदारी –कुशल पर्यवेक्षण	– रूचि में कमी – प्रशिक्षण में कमी

निष्कर्ष :–

निष्कर्ष रूप में कहा जा सकता है कि वर्तमान परिप्रेक्ष्य में साक्षात्कार तथ्य संकलन की विधियों में महत्वपूर्ण प्रविधि है। वर्तमान में विविध प्रकार के व्यवहार प्रतिमानों के अध्ययन के लिए साक्षात्कार विधि का प्रयोग किया जा रहा है। यही नहीं संरचित व असंरचित साक्षात्कार के माध्यमों से देश–विदेश में कई शोध कार्य किये जा रहे है। अन्य प्रविधियों की तुलना में सामग्री संकलन के लिए साक्षात्कार प्रक्रिया का महत्व अधिक है। क्योंकि अनेक गुणात्मक तथ्यों तथा व्यक्ति के विचाराभावों व मनोवृतियों को साक्षात्कार द्वारा भली–भाँति समझा जा सकता है। मैंने अपने प्रस्तुत पत्र में साक्षात्कार, संरचित व असरचित साक्षात्कार को समझाने का प्रयास किया है। वर्तमान में बढ रहे टेलीफोन साक्षात्कार के बारे में चर्चा की है। एक अच्छे साक्षात्कार की शर्ते साक्षात्कार के आयोजन में उपयोगी है। अनुसंधान की वस्तुनिष्ठा इस बात पर निर्भर करती है कि आपकी तथ्य संकलन प्रविधि का चुनाव किस प्रकार किया है? वर्तमान में यथार्थ अध्ययन व वैज्ञानिक परिणाम प्राप्त करने के लिए साक्षात्कार एक अच्छी प्रविधि है।

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Introduction of different types of data collection instruments

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Abstract

Social and educational research attempts to gain a very comprehensive understanding of the society and the educational process in a scientific manner by implementing effective research methodology. The research methodology, if implemented well, can provide us with vast range of information to broaden our knowledge so that we can improve the system through the acquired knowledge and database. Largely, the aim of any research is to contribute in the development of the life of the citizens and the society as a whole. The collection of data is one of the most crucial steps in the research process. Data collection is done in a more specified manner if the research process is being done in education, science and social science. In this paper, different types of data collection instruments will be discussed in detail so that any person conducting research will get a insight of what actually the data collection methods are available and how they can be used in the research process. If data collection is done in an effective manner, then it can be a very big helping hand in making your research a very successful process. There are many types of data collection instruments available, one must be capable enough to choose the most suitable instrument for their research process. For that to happen, detailed information of all the instrument should be provided.

Keywords – Educational research, Social research, data collection, society, development, knowledge.

1.Introduction

Data collection is a process where the analysis, collection and measurement of information is being done accurately for the research purpose (Questionpro, 2022). Data collection is mostly the most important step in the entire research process. Data driven research is considered as most reliable as it is objective in nature because it includes quantitative data which provides accuracy.

Before collecting the data , the researcher should be clear about what is the purpose of the his or her research , what kind of method is most suitable for conducting research and whether qualitative data or quantitative data will be required (Data Collection: Methods, Types, Tools, and Techniques, 2022).

2.Qualitative data and Quantitative data

Qualitative data is a data where a particular pattern, behaviour or culture is studied of a given population. It is not reliable as the result will always differ depending upon the population and its culture. This kind of data collection is subjective in nature (qualitative data, 2022) . If a researcher is

researching on teacher training programmes and he or she may collect data with the teachers involved in the programme and get to know about their experiences and how this programme has affected their lives.

On the other hand, the quantitative data is a data where the statistics is collected i.e., numerical data is collected as they are more reliable and they also provide precise information. In teacher training programme, the researcher can collect data as how many teachers comes from a particular area and what age group of tea hers are involved in the programme. This kind of research is objective in nature.

3. Different types of data collection instruments

Data collection method is very crucial as it not only provide information in the present time but , through the help of current data we can also predict the pattern in the future also which helps in the effective decision making process .Broadly, data collection tools are divided into two major categories, i.e., primary data collection and secondary data collection.

3.1. Primary data collection

Primary data collection is a method where data are collected by the researcher himself (Formplus Blog, 2022). It is collected directly from the leading sources like questionnaire, interviews, focus group etc. He himself collects the data first handed, thus they result in high accuracy although this process is not time and cost effective. There are various types of primary data collection explained below –

Questionnaire

This is a method where list of questions is being prepared by the researcher relevant to his research topic and then the questionnaire is being sent through the mail to the respondents or they are filled by the respondents by distributing to them in person. The questions are either open ended or close ended.

Interviews

Interviews are conducted to collect information directly through interacting from the respondents. The interviewee may ask complement questions also (Interview Method of Data Collection in Research, 2022). This method is conducted either through direct person to person contact or through mail or phone also. This method is most effective as the source of information is much reliable here.

Focus group

In this method a group of people is accommodated at one place and the researcher can discuss the issues with them. This method is quite helpful as it provides insightful information at once from so many people together.

Projective Technique

This method is applied on those people who are not willing to answer or who hesitate to answer the questions being asked to them. So, it is a kind of indirect interview where incomplete questions are being asked and the respondents have to fill them according to their attitude and feelings.

3.2. Secondary data collection

This method is of data collection does not provide first hand knowledge but it is obtained through pre-recorded information or data (harappa education , 2022) . It is to be noted that secondary data collection can be collected through quantitative and qualitative data. The sources of qualitative data can be diaries, newspapers, interviews and the sources for quantitative data is statistics, surveys etc. The types of data collection methods are –

Libraries

Public libraries have vast source of readings, publications, recorded data which helps the researcher to obtain the necessary information for the topic.

Internet

Collecting information from internet is one of the most useful sources of information, as readily available data is provided within a click of a button. Internet is like ocean of knowledge and data. one can avail any kind of information or data from the internet at any time and from anywhere.

Source of commercial information

Variety of information is also collected through sources like newspaper, television, radio, magazines. It is a great source of information related to economic development, political agenda, market research and demographic segmentation.

   One can very easily get the secondary data at its disposal. This method is also time effective and cost effective .Although , data might not be sufficient enough and it might not fulfil the needs of the researcher .

4.Conclusion

Data collection tools and techniques are to be used according to one's requirement of his research topic. Both the methods can also be used. In teacher training programme, questionnaire or schedule method can be used in collecting data from the teachers. To make this process more effective one must include closed ended questions so the process can be concluded within a short period of time. Secondary source of data can also be used by relying on certain pre-recorded experiences of the teachers or through some published or unpublished article. The results obtained through the collected data should contribute in the development of the life of the citizens and the society as a whole.

It is to be noted that the research to be conducted often fails due to poor selection of the methods of data collection. It is highly recommended that a researcher must thoroughly go through all the data collection method before starting his or her research work.

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Concepet and Ethics of Developing a Research tool

एक शोध उपकरण विकसित करने की अवधारणा एवं नैतिकता

शोधकर्ता – नवीन कुमार पारीक

नामाकंन नम्बरः– 20110660102009

शोध–निदेशकः– डॉ. माधुरी दत्ता

मौलाना आजाद विश्वविद्यालय गॉव–बुझावर, तहसील–लूणी, जोधपुर

Abstract :-

The construction of the test refers to the final selection of the terms and questions of the test.To be arranged in sequence. Steps are used to construct the test-- 1. Preparation of test plan 2. Preparing the preliminary form of the test 3. Testing the preliminary form of the test 4. Term analysis (A) Explanation of the term analysis (B) Methods of term analysis - (i) Stanley's term analysis method (ii) Symonds method (iii) Davis discriminant index (iv) Flanagan product moment correlation coefficient method (c) Selection of terms (d) Advantages of term analysis 5. Final Form 6. Certification 7 Standards Ethics Testing Standards for Developing a Research Tool Therefore, the standard on any test is the score which is obtained by a particular group, its ethics are as follows-- (1) From the standard of scores of a learner His place in the canonical group is determined by comparison. (2) The scores of a test can be converted into standard marks based on the standards. (3) For which group and for what purpose the test should be used i.e. the standard is also necessary for the usefulness of a test. (4) Standards are necessary for group classification or positioning. In any psychological test, mainly four types of parameters are used to analyze the marks of the examinee. Practical Criteria for Good Testing - 1. Purposefulness 2. Comprehensiveness 3. Economy 4 Universality 5. Utility 6. Representation. Technical Criteria of Testing: 1 Standardization 2 Objectivity3.Differential. 4 Reliability 5 Validity 6 Standard. Steps of test construction1-Planning 2- Preparation 3- Evaluation or Try out or Item & Analysis 4 Selction of to items 5 Standardization. **Ethics for the preparation of a good questionnaire-** (1) First of all, an attempt should be made to understand the attitude of the respondents. (2) The answer to the questions should be subtle. (3) Questionnaire should be introduced in research only when it is more important than the problem and is also useful from the point of view of the members of the sample. (4) Unnecessary questions should not be included in the questionnaire. (5) The circumstances to be included in the formulation of questions should be general. (6) The importance of each question should be different, the nature of the questions should be simple and general. (7) As far as possible, the nature of the question should be such that it can be summarized. (8) The nature of the questions should be such that the inclusion of subjectivity can be minimized. (9) Signs, symbols should be used for the questions whose answers are more long. (10) A good questionnaire generates curiosity among the respondents. (11) The question should not be repeated under the questionnaire.

शोध उपकरण विकसित करना अवधारणाः–

1. **प्रस्तावना :**—उपलब्धि का मापन करने हेतु परीक्षण का निर्माण किया जाता है। भिन्न–भिन्न क्षेत्रों की उपलब्धि के मापन हेतु भिन्न–भिन्न प्रकार के परीक्षणों का निर्माण किया जाता है। प्रत्येक परीक्षण विशिष्ट उद्देश्य की पूर्ति हेतु बनाए जाते हैं। किसी एक परीक्षण के द्वारा छात्र के सभी पक्षों का मापन तथा सभी उद्देश्यों की पूर्ति सम्भव नहीं है। परीक्षण के निर्माण से तात्पर्य परीक्षण के पदों एवं प्रश्नों को अन्तिम रूप से चयन कर क्रम में व्यवस्थित करना है। पदों एवं का चयन करने से पहले उनका उचित तरीके से मूल्यांकन किया जाता है। किसी भी विषय के लिए परीक्षण का निर्माण करने के लिए निम्न चरणों का प्रयोग किया जाता है:

1.परीक्षण योजना बनाना

किसी भी कार्य को सफलतापूर्वक सम्पन्न करने के लिए कार्य के प्रारम्भ में ही उसकी योजना आवश्यक है। यही बात परीक्षण पर भी लागू होती है। परीक्षण निर्माण से पहले ही उसकी बनाना आवश्यक है। योजना के अन्तर्गत सबसे पहले उद्देश्यों को निर्धारित किया जाता है। श्यों के निर्धारण के द्वारा यह निश्चित किया जाता है कि इस परीक्षण का निर्माण क्यों किया जा है? या इसके माध्यम से हम क्या मापन करेंगे उद्देश्यों को स्पष्ट होना चाहिए, स्पष्ट उद्देश्यों के द्वारा ही परीक्षण की योजना अच्छी बन सकेगी। उद्देश्यों के निर्धारण के बाद उद्देश्यों पर आधारित –वस्तु का चयन किया जाता है, जिसके आधार पर परीक्षण बनेगा और जो निर्धारित उद्देश्यों की पूर्ति करेगा। यदि हिन्दी की योग्यता परीक्षण के द्वारा हिन्दी की सामान्य योग्यता की जाँच करनी सामान्य पाठ्यवस्तु का चयन किया जायेगा और यदि व्याकरण की योग्यता की जाँच करनी तो केवल व्याकरण की ही पाठ्यवस्तु ली जायेगी। विषय वस्तु के चयन के बाद उसकी प्रशासन परीक्षण का माध्यम (हिन्दी या अंग्रेजी), अंकन विधि व समय सीमा आदि भी निर्धारित की जाती है।

2. परीक्षण के प्रारम्भिक रूप की तैयारी

परीक्षण की योजना बनाने के बाद परीक्षण के प्रारम्भिक रूप की तैयारी की जाती है। प्रारम्भिक रूप की तैयारी के अन्तर्गत उद्देश्यों पर आधारित चयनित की गई विषयवस्तु पर पदों व प्रश्नों का निर्माण किया जाता है। प्रश्नों व पदों का स्वरूप इस प्रकार का होता है कि वे चयनित विषय–वस्तु का प्रतिनिधित्व कर सकें। प्रश्न या पदों का निर्माण करने के बाद उन्हें तार्किक व व्यवस्थित तरीके किया जाता है। यदि एक ही प्रकार के पदों का प्रयोग किया जायेगा तो परीक्षण अरुचिकर हो जायेगा। परीक्षण–निर्माता सम्पूर्ण परीक्षण में एक ही प्रकार के पदों को सम्मिलित करने पर बल देते है। इससे परीक्षण का प्रशासन सरल हो जाता है। पदों को एकत्रित करने तथा उसके तार्किक क्रम में व्यवस्थित करने के बाद पदों का संबंध करना आवश्यक हो जाता है। पदों को एकत्रित करते समय यह हो सकता है कि उसमें व्यर्थ के सम्मिलित हो गए हो, अतः उनका सम्पादन आवश्यक है। इस कार्य के लिए जिस विषय का परीक्षण बनाया जा रहा है उसके विशेषज्ञों के पास एकत्रित पदों को भेजा जाए तथा उनसे सुझाव लिए जाएं। उपयुक्त पदों के चुनाव के अतिरिक्त उनके शब्दों की शुद्धता, पदों का रूप तथा एक पद का ही सही उत्तर हो इसकी भी जाँच विशेषज्ञ द्वारा

की जाए। विशेषज्ञ जो भी सुझाव दें उसके अनुसार पदों में परिवर्तन किया जाए या उन्हें परीक्षण से निकाल दिया जाए। पदों के सम्पादन के पश्चात् परीक्षण के प्रशासन से सम्बन्धित निर्देश लिखने चाहिएँ ।

3. परीक्षण के प्रारम्भिक रूप की जाँच करना

परीक्षण की योजना बनाने तथा उसके प्रारम्भिक रूप की तैयारी के बाद प्रारम्भिक जाँच करना आवश्यक है। इसके अन्तर्गत यह ज्ञात किया जाता है कि अच्छे परीक्षण के गुण नव–निर्मित परीक्षण में हैं या नहीं अर्थात् परीक्षण में विश्वसनीयता व वैधता के गुण है। परीक्षण के पदों में विभेदकारिता के गुण हैं या नहीं, कोई पद व्यर्थ ही तो सम्मिलित नहीं है आदि। अतः परीक्षण की वास्तविक रचना से पूर्व उसके प्रारम्भिक रूप की जाँच करना चाहिए। परीक्षण के प्रारम्भिक रूप की जाँच के लिए परीक्षण को 25 या 30 छात्रों पर प्रशासित किय जाता है। या 25 या 30 छात्रों पर प्रशासित किया जाता है। ये 25 या 30 छात्र उसी समूह प्रतिनिधि छात्र होते हैं जिनके लिए परीक्षण का निर्माण हो रहा है। इन छात्रों द्वारा परीक्षण को में जितना समय लगता है उतना समय परीक्षण को प्रशासित करने के लिए निश्चित कर लिया ब है। जिन पदों में अधिकतर छात्र कठिनाई अनुभव करते हैं उन्हें परीक्षण से निकाल दिया जाता है। यदि किन्हीं पदों में यह लगे कि छात्र इनके उत्तर अनुमान से दे सकते हैं तो शुद्धिकरण सूत्र प्रयोग करना चाहिए।

4. पद विश्लेषण :–परीक्षण जिसका प्रत्येक व्यक्तिगत पद योग्य सामान्य तथा अयोग्य में विभेदीकरण कर सके। एक अच्छे परीक्षण में परीक्षित की जाने वाली बातों को स्पष्ट करने की क्षमता होना चाहिए कि परीक्षण का उद्देश्य किस गण को जॉब करना है। को अधिक सम्मिलित पदों का अध्ययन तथा विश्लेषण करना चाहिए प्रत्येक रूप से अध्ययन तथा विश्लेषण करने की प्रक्रिया हो पद विश्लेषण कहलाती है।

(अ) पद विश्लेषण की व्याख्याः–पद विश्लेषण एक ऐसी प्रविधि है जिसके द्वारा पदों में सुधार बेकार पदों को निरस्त तथा युक्त पदों का चयन किया जाता है। अतः पद विश्लेषण विधि में परीक्षण में सम्मिलित होने समस्त पदों का व्यक्तिगत रूप से अध्ययन तथा विश्लेषण किया जाता है। प्रत्येक पद का रूप से अध्ययन तथा विश्लेषण करना आवश्यक है जिससे क्षण के अन्तिम रूप की रचना के पदों का चयन परीक्षण के उद्देश्य एवं विषय–वस्तु के अनुकूल हो सके

फ्रीमैन के अनुसार पदों के मूल्यांकन में दो पहलुओं पर मुख्य रूप से विचार करना चाहिए–नयम, प्रत्येक पद का कठिनता स्तर तथा द्वितीय प्रत्येक पद को विभेद शक्ति गर्ल्ड के अनुसार, परीक्षण के अन्तिम रूप की रचना करने से पूर्व श्रेष्ठ पदों के चयन हेतु पद–विश्लेषण विधि का प्रयोग अत्यन्त उपयोगी है। सम्पूर्ण परीक्षण के विभिन्न गुण इसमें निहित होने वाले पदों के गुणों पर निर्भर चिहते हैं, परीक्षण के पदों का विश्लेयह करने के लिए किया जाता है कित्येकदा कई स्तर क्या है पद की विभेदकारिता किम तथा अत्येक पद में कितनी बेचता है। पढ़ वैधता के द्वारा पद को विभेदकारिता ज्ञात को जाती है। विभेदकरता के द्वारा योग्य सामान्यतया कमजोर छात्रों से भेद ज्ञात

किया जा सकता है। यदि किसी पद में यह नहीं है तो वह व्यर्थ पदरोगा और उसे परीक्षण से निकाल दिया जायेगा। पदमता के द्वारा यह ज्ञात किया जाता है कि कोई पद कितना सरल तथा है। यदि किसी पद को 75 से अधिक करतो हद सरल होगा और यदि किसी पद को केवल 250 प्रतिशतको करें यह पद कठिन होगा। आन अत्यधिक कठिन और अधिक पदों को भी परीक्षण से देना चाहिए।

(ब) पद विश्लेषण की विधियाँः—

(प) स्टेनले की पद विश्लेषण विधि—

यदि प्रविधि अधिक प्रयुक्त की जाती है, क्योंकि पद वैधता का मूल्यांकन करने की यह श्रेष्ठ विधि है और सरल भी। स्टेनले की पद विश्लेषण विधि के अन्तर्गत सम्पूर्ण न्यादर्श को दो समूहों में विभक्त किया जाता है। यह विभाजन 27 प्रतिशत के आधार पर किया जाता है। जिनके उच्चतम अंक होते हैं ऐसे 27 प्रतिशत छात्रों को निकाल लिया जाता है तथा जिनके निम्नतम अंक होते हैं ऐसे 27 प्रतिशत छात्रों को निकाल लिया जाये। समूहों को उच्च समूह तथा निम्न समूह कहते हैं। प्रत्येक पद के सही प्रत्युत्तरों की गणना तथा निम्न समूह का अलग–अलग योग किया जाता है। फिर दोनों समूहों (उच्च प्रत्युत्तरों के मध्य अन्तर ज्ञात किया जाता है जो कि वैधता की मात्रा को व्यक्त करता है। उच्च एवं निम्न समूह के बीच जितनी अधिक विभेद–शक्ति रखेगा, उस पद की वैधता भी ही अधिक होगी। इसमें सूचकांकों का प्रसार 0 से 100 के मध्य होता है। ऋणमा सूचकांकों वाले पद अवैध तथा 11 से कम वाले पद कमजोर समझे जाते हैं।

(ii) सायमण्ड विधि—सायमण्ड विधि पद वैधता ज्ञात करने की सरल विधि है। इसमें न्यादर्श को दो समूहों में बांट लिया जाता है। श्रेष्ठ छात्रों तथा कमजोर छात्रों के दो अलग समूह बना लिये जाते हैं। प्रत्येक पद के सही प्रत्युत्तरों की गणना की जाती है तथा श्रेष्ठ और कम वर्ग का अलग–अलग योग ज्ञात कर लिया जाता है। उच्च या श्रेष्ठ छात्रों के सही प्रत्युत्तर कमजोर या निम्न वर्ग के छात्रों के सही प्रत्युत्तरों के मध्य अन्तर ज्ञात किया जाता है। यह अना पद वैधता है। सायमण्ड विधि के अनुसार सूचकांकों का प्रसार = 20 के मध्य होता है। सूचकांक वाले पद अवैध तथा 14 से कम वाले पद कमजोर समझे जाते हैं।

(iii) डेविस विभेदकारी सूचकाक—डेविस विभेदकारी सूची के आधार पर पदों का विमूल्य ज्ञात किया जाता है। यह पदों का विभेद मूल्य ज्ञात करने को महत्त्वपूर्ण विधि है। इसमें 27 प्रतिशत उच्च तथा 27 प्रतिशत निम्न व्यक्तियों को छाँटा जाता है। फिर प्रत्येक पद के प्रत्युत्तरों की गणना कर उच्च तथा निम्न समूहों का अलग अलग योग किया जाता है।

निम्न दोनों समूहों के सही प्रत्युत्तरों के मध्य अन्तर ज्ञात किया जाता है डेविस की विभेदकारी पुर

के आधार पर विभेद मूल्य ज्ञान किया जाता है। इस विधि के अनुसार सूचकांकों का प्रसार

100 तक होता है। ऋणात्मक तथा शुन्य सूचकांक वाले पदों का अवैध तथा 11 से कम 'डी' वाले पद को कमजोर पद समझा जाता है।

(iv) फ्लानागन प्रोडक्ट मोमेण्ट सह–सम्बन्ध गुणांक विधि–इस विधि के अनुसार पूरे न्याद र्ा को दो भागों में बाँटा जाता है। ये दो भाग उच्च तथा निम्न व्यक्तियों के होते हैं। 27 प्रतिशत से निम्न व्यक्ति इन समूहों में होते हैं। फिर प्रत्येक पद के सही प्रत्युत्तरों कर उच्च तथा निम्न समूह का अलग–अलग योग ज्ञात किया जाता है। उच्च समूह के सही प्रत्युत तथा निम्न समूह के सही प्रत्युत्तरों के बीच अन्तर ज्ञात किया जाता है। अन्त में फ्लानागन की सार द्वारा प्रोडक्ट मोमेण्ट सह–सम्बन्ध ज्ञात किया जाता है। फ्लानागन मोमेण्ट सह–सम्बन्ध गुणांक के अनुसार सूचकांकों का प्रसार 0 से + –.93 होता है। निम्न ऋणात्मक तथा निम्न धनात्मक पदों को परीक्षण से निकाल दिया जाता है। शून्य या ऋणात्मक सूचकांकों वाले पदों को अवैध व .25 से कम वैधता गुणांक वाले पदों को कमजोर पद समझा जाता है।

(स) पदों का चुनाव:–पदों की वैधता तथा पदों का कठिनता स्तर ज्ञात करने के लिए जो पद बेकार और कमजोर होते हैं उन्हें परीक्षण से निकाल दिया जाता है। केवल उन्हीं पदों को रखा जाता है जो उदेश्य आधारित हो चयनित विषयवस्तु पर हों तथा जिनमें विभेदकारिता का गुण भी हो अर्थात् जो योग्य सामान्य तथा अयोग्य छात्रों में भेद कर सकें। अच्छे पदों का चयन करके उन्हें परीक्षण में सम्मिलित किया जाता है।

(द) पद विश्लेषण के लाभ :–पद विश्लेषण उपयोगी है क्योंकि इसके माध्यम से परीक्षण को बनाया जा सकता है। पदों के आधार पर ही अच्छा होता है और यदि पद विश्लेषण के बिना परीक्षण में पदो लिया जायेगा तो यह उपयोगी नहीं होगा पद का पहला लाभ यह है। इसके माध्यम से पदों के कठिनाई स्तर को ज्ञात किया जाता है। परीक्षण को सोदेश्य बनाने में तरका विशेष महत्व होता है। जिन पदों का कठिनाई सूचकांक शुन्य है उन्हें परीक्षण में दिया है क्योंकि इससे उद्देश्य की प्राप्ति नहीं की जा सकती। पदणका दूसरा इसके द्वारा पविभेदकारिता शक्ति ज्ञात की जाती है। विभेदकारिता के द्वारा उच्च निम्नवाल में अन्तर किया जा सकता है। इसके अतिरिक्त पद के द्वारा पदों की वैधता भी ज्ञात की जाती है। इसके माध्यम महदेखा जाता है कि विषयवस्तु पर आधारित है या नहीं।

5. अन्तिम प्रारूपः पदों का सभी दृष्टिकोण से मुख्यान करने के बाद परीक्षण निर्माता परीक्षण की अन्तिम रूप मेरचना करता है। मूल्यांकन के द्वारा परीक्षण की नीयता देता पदो को विभेदकारी शक्ति जटिलता मूल्य भी पायाभकारी शक्ति में कोई तो आवश्यक उपायों के द्वारा पाया जाता के अन्तिम रूप कठिनता सापटीक इसके प समयसीमाविधिका निर्माण ह ऐसा होने से परागीका

6. प्रमाणीकरणः–परीक्षण का निर्माण किसी कक्षा ⁄ निश्चित स्तर के बालकों के लिए किया जाता है।

7. **मानकः–** परीक्षण के प्रमाणीकरण के लिए मानक ज्ञात करना अति आवश्यक है। परीक्षण के प्राप्तांकों को सार्थक बनाने के लिए मानक को विकसित किया जाता है। मानक को विकसित करने से परीक्षण की अर्थापन त्रुटि कम हो जाती है।

एक शोध उपकरण विकसित करने की नैतिकता

परीक्षण मानकः–जब नवीन परीक्षण की रचना पूर्ण हो जाये तो सर्वप्रथम एक बड़े प्रतिनिधि समूह पर मे प्रशासित करके उसकी जटिलता के सम्बन्ध में जानकारी प्राप्त करनी चाहिये। इसके बाद सूचनाओं को मानकों (छवतउे) में परिवर्तित करना चाहिये। एक परीक्षण की रचना इसलिये की जाती है कि व्यक्ति विशेष का मापन करके उस गुण–विशेष के सन्दर्भ में उसका स्तर जात किए जाये। किसी भी प्रकार के मानसिक अथवा मनोवैज्ञानिक परीक्षण में मूल प्राप्तांकों को प्राप्त करे के पश्चात् परीक्षण निर्माता के सामने समस्या यह आती है कि परीक्षण से प्राप्त मूल प्राप्तांकों के क्या आशय है? उनका विवेचन कैसे किया जाए? जैसा कि प्रथम अध्याय में ही लिखा जा चुक है कि मानसिक मापन सापेक्षिक प्रकार का होता है, जहाँ मूल प्राप्तांकों का अपना कोई अर्थ अथवा अस्तित्व नहीं होता।

परीक्षण के प्राप्तांक का अपना कोई अर्थ नहीं होता, अतः उन्हें सार्थक, व्यापाक एकरूप और वस्तुनिष्ठ बनाने के लिये परीक्षण के मानकों को विकसित किया जाता है। क्योंकि इससे परीक्षण की अर्थापन त्रुटि कम हो जाती है तथा परीक्षण का प्रमाणीकर होता है क्योंकि एक परीक्षण चाहे कितना ही विश्वसनीय एवं वैध हौ मानक के प्रमापीकृत नहीं माना जा सकता। दूसरे शब्दों में, परीक्षण प्राप्तांकों की विवेचना मनो के रूप में की जा सकती है।

मानक का अर्थः–सामान्यतः मानक एवं स्तर इन दोनों शब्दों को एक ही अर्थ में प्रयुक्त किया जाता है, लेकिन मापन की दृष्टि से इन दोनों में विभेद है। मानक का संदर्भ बिन्दु वर्तमान होता है. कि एक समूह का एक विशेष परीक्षण का औसत साफल्य कितना है जबकि स्तर का संदर्भ विन्दु भविष्य होता है कि एक समूह का एक परीक्षण पर क्या स्तर होगा? दूसरे शब्दों में, मानक किसी विशिष्ट समूह के व्यक्तियों के वास्तविक मापन का औसत प्राप्तांक है। इसी तरह मानदण्ड को मानक के अर्थ में प्रयोग करते हैं जबकि इन दोनों में भी प्रमुख अन्तर यह है कि मानदण्ड परिमाणात्मक एवं गुणात्मक दोनों प्रकार का प्रमाण होता है जबकि मानक साधारणतया परिमाणात्मक ही होता है।

अतः किसी भी परीक्षण पर मानक वह प्राप्तांक है जिसे किसी विशेष समूह द्वारा प्राप्त किया गया हो **उसकी नैतिकता निम्न हैः–**

(1) शिक्षार्थी के प्राप्तांकों की मानक से तुलना करके समूह में उसका स्थान निर्धारित किया जाता है।

(2) मानकों के आधार ही पर किसी परीक्षण प्राप्तांकों को प्रामाणिक अंकों में परिवर्तित किया जाता है।

(3) परीक्षण उपयोग किस समूह तथा किस उद्देश्य के लिए किया जाना चाहिए अर्थात् मानक एक परीक्षण की उपयोगिता के लिए भी आवश्यक है।

मानकों के प्रकार:–किसी भी मनोवैज्ञानिक परीक्षण में परीक्षार्थी के प्राप्तांकों की विवेचना करने के लिए मुख्य रूप से चार प्रकार के मानकों का प्रयोग किया जाता है:–

मानक के प्रकार	समूह प्रकार	तुलना प्रकार
1. आयु मानक 2. श्रेणी मानक 3. शतांशीय मानक 4.प्रतिमान प्राप्तांक मानक	अनुक्रमिक आयु समूह अक्रमिक श्रेणी समूह समआयु या श्रेणी समूह एक हो आयु या श्रेणी समूह	व्यक्ति की समूह से तुलना । व्यक्ति की समूह से तुलना । व्यक्ति द्वारा पार किया समूह प्रतिशत। सामान्य समूह से व्यक्ति के मानक विचलन की संख्या का विचलन।

टी–अंक मानक:– प्राप्तांकों में दशमलव चिह्नों तथा ऋणात्मक एवं धनात्मक चिह्नों की असुविधाओं के परिणामस्वरूप तुलनात्मक अध्ययन करना जटिल हो जाता है। ऐसी स्थिति में परमाणिक अंक मानक दूसरे रूप टी–अंक मानक का प्रयोग अधिक उपयोगी रहता है। इस प्रकार के मानक का प्रयोग, मैक्कॉल (डबंब्सस) ने किया था। ये वे मानक हैं जिनके प्राप्तांकों को सामान्यीकृत समूह में प्राप्त किया जाता है तथा जिनका मध्यमान 50 एवं मानक विचलन 10 होता है, अर्थात् दूसरे शब्दों में टी–अंक मापनी पर मध्यमान प्राप्तांक 50 तथा 10 मानक विचलन इकाइयों के समान होता है।

उत्तम परीक्षण (Good test)

व्यवहारिक कसौटियाँ (Practical Criteria)	तकनीकी कसौटियाँ (Technical Criteria)
1– सोद्देश्यता (Proposivness)	1. मानकीकृत (Standardized)
2– व्यापकता (Comprehensivene)	2. वस्तुनिष्ठता (Objectivity)
3– मितव्ययता (Economical)	3. विभेदकारिता (Discriminative)
4. सर्वमान्यता (Acceptability)	4. विश्वसनीयता (Reliability)
5. उपयोगिता (Utility)	5. वैधता (Valicity)
6– प्रतिनिधित्वता (Reprentative)	6. मानक (Norms)

परीक्षण निर्माण के पद (Steps of test construction):–सामान्य रूप से सभी प्रकार की वस्तुनिष्ठ परीक्षाओं के निर्माण की प्रक्रिया के निम्नलिखित चरण होते हैं–

1.नियोजन (Planning) 2. निर्माण (Preparation) 3.एकांश प्रश्लेषण मूल्यांकन (Evaluation or Try out or Item&analysis) 4 एकांशों का चयन (Selction of to items) 5. प्रमापीकरण (Standardization)

1.नियोजन (Planning**)**– किसी भी परीक्षा का निर्माण करने से पहले उसकी एक विस्तृत योजना तैयार करनी होती है। इसका अर्थ यह है कि परीक्षा संबंधीबहुत से निर्णय इस स्तर पर लेने होते हैं। उन्हीं के अनुसार बाद में सम्पूर्ण कार्य करना होता है। यदि यह निर्णय पहले से नहीं लिये जाते तो सम्पूर्ण कार्य की रूपरेखा अस्पष्ट रहती है तथा बाद में कई प्रकार की कठिनाईयां काम में बाधा डालती है। नियोजन के अन्तर्गत जो निर्णय शोधकर्ता को लेने होते हैं तथा जो अन्य कार्य इस स्तर पर करने होते हैं, ये इस प्रकार हैं–परीक्षा के उद्देश्य का निर्धारण अर्थात किस उद्देश्य की उपलब्धि हेतु परीक्षा का निर्माण किया जाना है। उद्देश्य के अनुसार परीक्षा के निर्माण की प्रक्रिया में कभी कभी अन्तर हो जाता है, यथा यदि परीक्षा का उद्देश्य चयन ;(मसमबजपवद) है तो उसके एकांशों (items) की कठिनाई का स्तर सीमित एवं ऊँचा रखना पड़ेगा, अर्थात परीक्षा कठिन बनानी होगी।

2.निर्माण (Preparation**)**– नियोजन का कार्य पूरा हो जाने के बाद परीक्षा के निर्माण का कार्य आरंभ होता है। इस स्तर पर निर्माता बहुत से एकांशों (item) को बनाता है। जिस प्रकार के एकांश परीक्षा में रखने का निर्णय लिया जा चुका है उसी प्रकार के तथा वांछनीय संख्या के दाने अथवा तिगुने एकांश बनाता है। इन एकांशों का स्रोत निर्माता का अपना अनुभव, अपना ज्ञान, पूर्व में बनी हुई उसी प्रकार की परीक्षाएं एवं संबंधित पुस्तकें होती है।

विशेषज्ञो के अनुसार एक **प्रमापीकृत परीक्षा की निम्नलिखित विशेषताएँ** होती हैं

1. उसकी विषय वस्तु का चयन परीक्षण के आधार पर किया जाता है।

2. उसके प्रशासन की विधि भी निश्चित एवं प्रमापीकृत होती है।

3.उसके स्कोरिंग की विधि भी वस्तुनिष्ठ एवं प्रमापीकृत होती है।।

4. वह पर्याप्त रूप से विश्वसनीय होती है।

5.वह पर्याप्त रूप से वैध होती है।

6. उसके मानक उपलब्ध होते हैं।

इनमें से पहली तीन विशेषताओं का निर्धारण तो परीक्षा का अन्तिम रूप तैयार होने तक ही हो जाता है। विषय–वस्तु का चयन एकांशों के विश्लेषण के आधार पर किया जाता है। उसी स्तर पर प्रशासन के निर्देश, प्रशासन की समयाविधि, उत्तरों के अंकन आदि का भी प्रमापीकरण हो जाता है। परीक्षा की विश्वसनीयता, वैधता एवं उसके मानकों का निर्धारण बाद में किया जाता है।

प्रश्नावली की रचना एवं उपयोग (preparing and administrating a Questionnaire)

प्रश्नावली की रचना में अधोलिखित **नैतिकता** की बातों का ध्यान रखना चाहिए–

(1) प्रश्नावली की नियोजन एवं निर्माण में सभी स्रोतों से अधिक सहायता ली जानी चाहिए।

(2) प्रश्नावली की नियोजन एवं निर्माण में आलोचना के लिए प्रस्तुत करें, विशेषकर ऐसे लोगों की जिन्हें प्रश्नावली निर्माण का अनुभव हो।

(3) प्रश्नावली भेजने के लिए सूचनादाताओं का चयन बहुत सावधानी से प्रश्नावली केवल उन्हीं व्यक्तियों को भेजें जो उसके बारे में सही हो तथा वस्तुनिष्ठ रूप से उत्तर देने को तैयार हों।

उत्तम प्रश्नावली की रचना के लिए नैतिकता/सुझाव (Ethics/Sugtions for Constructing a Good Questionnaire)

(1) सर्वप्रथम उत्तर देने वालों की मनोवृत्ति समझने का प्रयास करना चाहिए जिससे वे उत्तर देने को तैयार हो सकें ।

(2) प्रश्नों का उत्तर सूक्ष्म होना चाहिए। अधिकांश प्रश्नों का स्वरूप ऐसा जिन्हें केवल चिन्हित ही किया जाए।

(3) प्रश्नावली का शोध में आरम्भ तभी करना चाहिए जब वह समस्या की से अधिक महत्वपूर्ण हो तथा न्यादर्श के सदस्यों की दृष्टि से भी उपयोगी हो। इसके वली के साथ पत्र भी भेजना चाहिए जिसमें शोध के महत्व का उल्लेख किया और प्रश्नावली को भरने सम्बन्धी निर्देश भी दिए जायें।

(4) प्रश्नावली में अनावश्यक प्रश्नों को सम्मिलित नहीं करना चाहिए। का स्वरूप सूक्ष्म तथा बोधगम्य होना चाहिए। प्रश्नों की संख्या भी अधिक होनी चाहिए।

(5) जिन परिस्थितियों को प्रश्नों की रचना में सम्मिलित किया जा सामान्य होनी चाहियें। जिन विद्यालयों का आकार बड़ा होता है उनकी सम छोटे विद्यालयों की समस्याओं से भिन्न प्रकार की होती हैं। अतः सामान्य आ के विद्यालयों की समस्याओं को सम्मिलित करना चाहिये।

(6) प्रत्येक प्रश्न का महत्व पृथक् होना चाहिये तथा यह भी स्पष्ट चाहिये कि वास्तव में शोधकर्ता किस प्रकार की सूचनायें एकत्रित करना है। प्रश्नों का स्वरूप सरल तथा सामान्य होना चाहिए, जटिल प्रश्नों को सम नहीं करना चाहिये।

(7) जहाँ तक सम्भव हो प्रश्न की प्रकृति इस प्रकार की हो जिसके सुगमता से संक्षेपीकरण किया जा सके। प्रश्नों के उत्तरों की व्यवस्था भी सर से की जा सके। हाॅध्ना के प्रश्नों को इसलिये अधिक महत्व दिया जाता है।

(8) प्रश्नों का स्वरूप इस प्रकार का होना चाहिये जिसमें व्यक्तिनिष्ठ का समावेश कम से कम हो सके।

(9) जिन प्रश्नों के उत्तर अधिक बड़े हों, उनके लिये संकेतों, चिन्हों प्रयोग करना चाहिए।

(10) एक उत्तम प्रश्नावली उत्तरदाताओं में उत्सुकता उत्पन्न करती है।

(11) प्रश्नावली के अन्तर्गत प्रश्न सम्बन्धी पुनरार्वृत्ति नहीं की जाये। किन परिरिथतियों में सूचनाओं की वैधता तथा विश्वसनीयता के लिये कुछ प्रश्न दिव जा सकते हैं। जो दूसरे रूप में उन्हीं सूचनाओं को एकत्रित करते हैं।

एक उत्तम अनुसूची की विशेषताएँ (Characteristics of a Good Schedule)

प्रश्नावली एक अनुसूची का भी कार्य करती है जब शोध–कर्ता प्र को स्वयं व्यक्तिगत सम्पर्क करके भरता है। अतः अधिकांश विशेषतायें, की वही हैं जो एक उत्तम प्रश्नावली की होती हैं। शोध–कर्ता को तार्किक अनुसूची का विकास करना चाहिये। इसके लिए अधोलिखित मानदण्ड करने चाहियें–

(1) अनुसूची को शोध–कर्त्ता व्यक्तिगत रूप से देकर पूरा करता है। शोध–कर्त्ता निर्धारित समय में पूरा हो जाना चाहिये।

(2) शोध–कार्य धन की दृष्टि से भी मितव्ययी होना चाहिए।

(3) शोध–कार्य के अधिकतम पक्षों का अध्ययन भी किया जाना चाहिये।

(4) शोध–कार्य के लिए अपेक्षित स्रोत भी उपलब्ध होने चाहिये।

(5) उपलब्ध स्रोतो का उपयोग अधिक से अधिक होना चाहिये।

अनुस्थिती मापनी को नियन्त्रित करने वाले सिद्धान्त Principal Governing Rating Scales

(1) विशिष्ट गुण या व्यवहार की समुचित रूप में परिभाषा की जानी चाहिये।

(2) मापनी तथा उसके बिन्दुओं की स्पष्ट रूप से व्याख्या की जानी चाहिये।

(3) जिस गुण विशेष का मंचन किया जायेगा उसका निरीक्षण करना सम्भव हो।

(4) एक मापन स्तर पर प्रयोग निरीक्षण में होना चाहिये।

(5) मापनी पर अपने उत्तर को अंकित करने के लिये निश्चित स्थान होना चाहियें।

(6) अनुस्थिति मापनी को प्रयोग करने सम्बन्धी स्पष्ट निर्देश भी दे चाहिये।

(7) मापनी के मूल्यांकन के लिए अधिक निर्णायकों को सम्मिलित करना चाहिये जिससे उसे अधिक विश्वसनीय बनाया जा सके।

(10) मापनी के लिए ऐसे व्यक्तियों का चयन करना चाहिए जो मापनी, व्यक्तियों तथा गुणों से भली–भाँति परिचित हो।

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Data Collection Instruments in Educational Research

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Abstract

Data collection collects and analyses relevant data to answer research questions, test hypotheses, and evaluate results. It's essential to collect data for each research study. Even if you have the best study design globally, your project will fall short of its objectives if you cannot collect the essential data. If you want to get the best results from your research, you need to collect high-quality data that can be utilized to conduct in-depth analysis and deliver answers that are both convincing and believable. Regardless of the method used to define data, maintaining research integrity requires accurate data collection (quantitative or qualitative). To collect accurate data, one must plan meticulously, put in long hours, be dedicated, and have other attributes. Samples from specific demography are chosen after the research team has determined what kind of data they require. To collect data from your chosen sample, you'll need a specialized instrument. New, modified, or existing data-gathering equipment, along with detailed instructions on how to use them, reduce the likelihood of mistakes.

Keywords: Data collection, primary data, secondary data, qualitative and quantitative data, Interview, Questionnaire, Observation

1. Introduction

To begin, we must question, "What exactly is data?" In its simplest form, data is nothing more than information organized specifically. Obtaining data to answer research questions, as well as analyzing findings, predicting future trends, or assessing future probability, is referred to as data collection. Ultimately, the goal is to gain a thorough understanding of a certain subject. In modern society, the

importance of gathering data cannot be emphasized. Accurate data collection is essential for making educated business decisions, ensuring quality control, and preserving research integrity.

1.1. Why is data collection important?

For a researcher, data collecting serves a variety of essential goals. Data collecting is essential for several reasons, including:

1. The research's reliability: Data collection, whether quantitative or qualitative, has as one of its primary goals to ensure the integrity of the study topic.
2. Reduce the likelihood of mistakes or omissions: The likelihood of errors during various research processes is reduced when appropriate data-gathering strategies are properly utilized.
3. Making decisions that are both accurate and efficient: It is critical to acquire exact facts to prevent experts from making ill-informed decisions to reduce the risk of mistakes or errors in decision making.
4. Save money and effort: Saving time and money by gathering data.
5. Initiates the growth of a new thought or idea: It is critical to gather data and evidence to support the argument for an adjustment or a new change.

2. Types of data collection

Primary and secondary data collection are two broad areas of data collection.

2.1. Primary data collection

Primary data refers to information that has been gathered directly from individuals with first-hand knowledge of an event or situation. It is more trustworthy because it is drawn from sources. Primary data is more reliable than secondary data because it has not been tampered with by humans. It could be further broken down into qualitative and quantitative approaches to data collection.

The qualitative approach to data collection: Words are used to express it. Concepts, thoughts, and memories can all benefit from this analysis method. Allows for in-depth analysis of topics that are poorly understood. Interviews, written accounts of observations, and literary appraisals of concepts and hypotheses are all examples of qualitative methods.

The quantitative approach to data collection: It is represented graphically and numerically. It is a tool for verifying or disproving hypotheses. These findings can be applied to a wide range of topics. Quantitative approaches include experiments, numerical observations, and surveys with predetermined answers.

Sources of Primary Data: Questionnaire, Interview and Observation are the basic sources of primary data

2.1.1. Questionnaire

A questionnaire is a research instrument that asks respondents questions to acquire relevant information. These devices may include written or spoken queries. Research tools such as questionnaires have

become increasingly popular due to their ability to collect vast amounts of data quickly, efficiently, and cheaply. Measuring preferences, intentions, attitudes, and views can be done with these instruments effectively.

Types of Questionnaires based on Distribution

1. Postal: The mail is used to send out postal questionnaires, which are paper surveys that participants fill out.
2. In-house: The survey is administered by researchers who visit respondents' homes or workplaces.
3. Telephone: Respondents are contacted by researchers who administer the survey over the phone.
4. Electronic: A variety of internet mediums, such as email, can be used to distribute electronic surveys.

Types of questions in a questionnaire

1. Open-ended questions: There are few or no limits on how the respondent can answer a questionnaire using this tool.

2. Closed-ended questions: An option to select from predefined responses are offered to respondents. When conducting a large-scale survey, it is ideal to use closed-ended questions.

3. Dichotomous questions: Typically, a dichotomous question is a yes-or-no answer.
4. Multiple-choice questions: There are two basic types of multiple-choice questions: single-select and multi-select.
5. Scaling questions: These are based on the four measurement scales (nominal, ordinal, interval, and ratio). Some common scales that make use of these fundamental properties are rank order, Likert scale, semantic differential scale, and Stapel scale.
6. Pictorial questions: Respondents are given a question to respond to, and the options are photos.

Steps to be followed in questionnaire construction and writing the report

1. Identifying the survey's intended audience.
2. Choosing which type of questions to ask (closed or open-ended).
3. Drafting the Questionnaire.
4. Using a sample of the population to test the Questionnaire.
5. Adapting the survey to the feedback we've received.
6. Sending out the survey to those who will be receiving it.
7. Notifying the study's participants of the importance of their participation.
8. Responding to the feedback.
9. Interpreting and analyzing the data that has been received.
10. Doing research and compiling data for the report.

2.1.2. Interview

Interviewing study participants entails asking them questions and obtaining their responses. There are many ways to conduct an interview, including one-on-one and group interviews. The telephone or other electronic devices can facilitate the exchange of questions and answers (e.g., computers).

When conducting an interview, it is possible to choose from various approaches.

Structured Interview: Researchers use structured interviews when they want to conduct research with instruments that are extremely rigorous in their functioning and give participants little or no latitude in how they are prompted to gather and interpret data. Thus, it is a standardized interview and is primarily quantitative. The interview questions have been pre-decided based on the level of detail requested. When conducting a survey, structured interviews are frequently utilized to keep the interview sessions consistent.

Semi-structured Interview: Semi-structured interviews provide the researcher with many latitudes while keeping the interview format. Even if researchers and interviewees have a pre-planned conversation, researchers have a great deal of freedom. With the Interview's format in mind, researchers can pursue any topic or take creative advantage of the Interview. Researchers should employ semi-structured interviews if they are limited on time and need a lot of information on a particular topic.

Unstructured Interviews: For research purposes, an in-depth interview, or an unstructured interview, is a dialogue to obtain information. Most researchers use unstructured interviews to establish a personal connection with their subjects, which increases the likelihood that they will be completely honest in their responses. Researchers are free to conduct their studies in any way they see fit, as there are no rules dictating how they should approach their subjects.

Interview Process

1. Plan: During this stage, the interviewer's preparation, interview duration, and the interview location are all planned out.

2. Preparation of interview schedule: Printed questions are arranged in a certain order or sequence on the interview schedule. In advance, the interview schedule is set. Those taking this project (researcher, interviewer, or just the enumerator) require to practise conducting the Interview. But we can't overlook the interviewer's bias when interpreting the responses.

3. Pilot test of the schedule: It's a good idea to practise your interview questions before the real thing. The pilot study's interviewees should be chosen at random. To conduct a proper study, this group should not be included.

4. Conducting the Interview: The interviewer should plan the venue, time, and other interview specifics. When asking a question, it's important to use precise language. The interviewer needs to be knowledgeable about interviewing tactics. The interviewer is responsible for creating an environment of mutual trust, confidence, and civility. At the end of the Interview, the interviewer must thank the participants for their participation.

5. Recording the Interview: Recording responses on an interview schedule is simple in structured interviews when most questions are closed-ended. Taking notes is what we refer to as the note-taking method. Open-ended inquiries are difficult and time-consuming to respond to. A verbatim transcript of the interviewee's answers can be obtained by using the tape-recording method.

6. Preparation of Verbatim Transcripts: Transcripts are created by taking the audio recordings and turning them into text. It is the core research material.

7. Analysis of Data and Report Writing

2.1.3. Observation

People and events are observed in their natural setting as part of an investigation method. For the first time, researchers will be able to observe their subjects in the actual world rather than in a lab or focus group.

Classification of Observational Method

1. Natural Observation: There are no efforts to alter the observer's behaviour in this observation form. Natural observations can improve information gathering and the context in which an observation is made.

2. Direct and Indirect Observation: By employing the direct way of Observation, one can see how the observer is physically present in the event being seen and what is happening in this method. It is possible to conduct indirect observations by analyzing mechanical recordings, such as those made with a camera, as well as electronic or photographic recordings. Direct Observation is easier than indirect Observation in terms of the amount of information gleaned from it.

3. Participant and Non-Participant Observation: Observers participating in various operations of the research group are examples of a participant kind of Observation. The nature of a study, as well as the scenario and the expectations placed on it, have a significant impact on the level of involvement. On the other hand, non-participants observing a group without being a participant means no relationship between the researcher and the group members.

4. Structured and Unstructured Observation: Structured Observation is based on a predetermined plan that specifies the units to be observed and the data to be collected. The procedures to be watched and the numerous features to be documented are determined. These kinds of observations necessitate specialized tools to capture organized data. In the unstructured Observation, the observer is free to record whatever they believe is important to the study. In an exploratory study, this type of Observation is ideal.

5. Controlled and Un-controlled Observation: An observation is considered controlled if made under the guidance of an outside entity. With mechanical synchronization devices, film recording, etc., these observations are highly powerful. An uncontrolled observation is conducted outside of a laboratory or controlled environment. Any external force does not influence these observations.

Steps of Observation

1. Determine research objective: Decide what you want to learn and who you want to observe, and why.

2. Create a list of questions and a roadmap to research: Consider the research questions you've asked and devise a strategy for gathering information.

3. Set up a way to collect data: Your role in the learning process might either be a passive observer or a proactive one. You can choose to record audio or video, snap photos or write notes during the trip.

4. Observe: Observe and collect data in the real world. Get the permissions you need before you begin.

5. Prepare data: Transcribe all of the recordings you have made from audio or video and begin to organize your notes and files.

6. Analyze behaviours in data: To find patterns and trends in your data, use a systematic approach to organizing and categorizing it.

Advantages of primary data

1. Studying a problem necessitates collecting data that is pertinent.

2. There are no doubts about the quality of the data gathered (for the investigator).

3. It may be possible to collect more data during the study.

Disadvantages of primary data

1. What, how and when to collect data; acquiring finances and engaging with funding organizations; ethics; and obtaining data themselves or through others are only some of the issues the researcher must deal with (consent, permissions, etc.).
2. Accurate data is required, which means it must be presented correctly; it must not contain any fake or cooked-up information, and it must not include any extraneous or pointless data.
3. In many studies, collecting data is the primary expense.

2.2 Secondary Data Collection

When someone else collects second-hand data from a source other than the original user, it is called "secondary data collection." It's the act of putting together knowledge that already exists. It's significantly less expensive, and it's much easier to obtain.

A secondary data source is anything other than the primary data that the researcher collected. It includes published census data, published records, biographies in newspapers, data archives, articles in scholarly publications, and various databases.

The importance of secondary data may include fewer valid points, yet it is still important. There are occasions when collecting primary data is difficult; in these cases, secondary data is more accessible. In other cases, primary data is not available. Secondary data must be used in the study. The respondents may have the data, but they're not eager to share it. You can also make use of secondary data sources in this circumstance. Primary study design can also benefit from secondary data. They can serve as a benchmark against which the outcomes of primary data collection can be evaluated. A review of the secondary data should be the first step in conducting any research.

Advantages of secondary data

1. There's no need to worry about data collection.

2. It's less costly.

3. The quality of the data is not the responsibility of the researcher.

Disadvantages of secondary data

1. The third-party data may not be trustworthy; therefore, the data's reliability and accuracy are lowered by the third-party collection.

2. Because of the different environmental conditions in each site, data acquired in one area may not be appropriate for use in the other.

3. As time passes, the information becomes increasingly out-of-date and even old-fashioned.

4. The inclusion of erroneous secondary data can skew the study results. Using secondary data necessitates additional attention to edit or modify it.

5. Authenticity and copyright concerns might arise from secondary data as well.

3. Conclusion

In educational research, the data collected is evaluated and interpreted using data gathering methods. As a result, gathering data is a critical step in any research project and can considerably impact the outcomes. Methods of data collecting are defined after research questions, and data sources have been established. A wide range of more specialized methods is used to acquire data. Efficient data collection devices (existing, modified or new) and clear instructions on using them are essential to avoiding data inaccuracies.

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Errors in Measurement: 'Ethical Implication in Decision Making of Learners'

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Abstract

Measurement in the behavioural sciences always having some errors. In the physical sciences it is already existing in the standardized calibrated instruments. It is quite different in behavioural and psychological measurement where education is a subcategory. The variables measured in education are hypothetical and indirect. It requires the efforts of the classroom teacher to develop a test, but he/she may not have the right skills and techniques to construct a valid and reliable test. These skills insufficiency, lack of expertise and a host of other factors, bring errors in measurement. Now, question arises, why do we take decision with scores that are affected by measurement errors? It is the thrust of this research work. Author explored 'measurement errors, causes of measurement errors, steps for reducing errors in measurement as well as the implication effect of measurement errors in learners' assessment in the classroom setting. It was recommended that if examinations and tests are utilized for decision-making of future learner, then, it is need to ensure the all testers, testing situations and variables are in well planned, so that errors are reduced, if not be eradicated.

Keywords: systematic, error, learner, assessment, decision-making, explored, behavioural science, classroom

Introduction:

The concept of measurement is as old as man himself. This is because; the universe was largely a product of measurement. At various times, even in scriptures we read how erecting a building or temple with given specifications. The activities of measurement are inherent in all human activities. The type of clothes to wear, the quantity of water for cooking a particular soup, are all determined by the elements of measurement. This implies that even the illiterates, cannot do without measurement.

The concept of measurement has been given diverse definitions. Nenty (2000) Denga (2003), Joshua (2005) and Ofem and Anagbogu (2015) defined measurement as a systematic process of assigning numerals or numbers of events, places, objects and variables rather than using lengthy word or descriptive phrases. It is basically exercise of numbers and figures. It is the representation of information in quantitative manner.

The Test, Measurement and Evaluation in education is aimed at:

➢ Equipping, the teacher with right techniques that will aid him/her to measure whatever he/she is measuring with objectivity.
➢ Developing the skill that will help in constructing instrument that are reliable and valid in learner's assessment.
➢ Understanding the techniques for data collection, analysis and presentation
➢ Ascertaining the extent to which learners have achieved a given level of objective.
➢ Making the right judgment based on gathered information.

However, measurement in physical science is different from the measurement in psychological or behavioural sciences. Measurement in the physical sciences is more precise, accurate and easy to be carried out. This is due to the fact, that these activities are carried out under a strict experimental conditions, where, extraneous variables relatively constant as well as standardized, calibrated instrument can easily be applied all situations. However, this is sharply different in psychological testing and measurement.

Psychological measurement:

Psychological measurement involves the use of human elements that are quite different and difficult to predict. The variables that are measured in this aspect of measurement are unstable. This is because; a trait exhibited today can be changed tomorrow at geometric rate, giving rise to an entirely different outcome. Psychological tests (also known as metal measurement, psychological instrument, psychometric test) are standardized measures of a particular variable such as personality, intelligence or emotional functioning. Psychological measurements are concerned with the measurement of a sample of human behaviour. This implies that only a part of the individual is assessed and the respondent is often required to do something in order to obtain a score that would be used to infer the presence or absence of the variables being measured. The respondents are therefore, to be placed on a scale of calibrated with a range of items considered valid and reliable to measure such a variable. Now, question arises is, how items are valid in the scale? Can the responses provided by the participants or respondents be consistent over a given period of time? Would there be variations in scores? If this does not occur, then, what will be the problem? There is the issue of error in the measurement comes. On this basis, Kane (1993) paradoxically noted, that error of measurement do not exist, but they are essential. There is nothing about a single test score or a pair of scores that implies the presence of errors in measurement. However, if two scores are taken to be measures of the same variable for the same person, we expect them to be equal, and if they are not equal, our data are inconsistent with our conceptual framework. We can resolve this doubt by assuming one or both of the measurements contain errors.

Measurement error:

'Charles Spearman' was one of the founders of classical test theory, having an understanding that there were generally always going to be errors in test measurement, these errors are random variables and could be correlated and indexed. The term error is causes deviation in scores of measurements. The two types of errors, generally, discussed in behavioural sciences are 'Random error and Systematic error (Roberts, 2006)'.

As per classical theory, every observed score has two components: true score and error score. Classical test theory assumes that each person has a true score, that would be obtained if there is no error in measurement. Unfortunately, test user never obtained a person's true score, only an observed score. It is assumed that observed score = true score plus or minus some error;

Observed score = True score (T) ± Error score (E);

i.e. $X = T \pm E$

Where E = systematic error and Random error

As indicated by the notation, the true score depends on the person not on the conditions of observation, while the error and the observed score depends on both the person and the specific observation. The error varies from observation to observation and from person to person. The true scores of classical test theory are variables or constructs. The value of this variable is stipulated and remain same across repeated measurements (Messick, 2008).

The assumption in classical test models are: expected error scores will be equal to zero, correlation between error scores on parallel test is zero, correlation between error scores on one measurement and true score in the same measurement is zero (Alordiah & Ochuku, 2016). These assumptions imply that with repeated measurements, random errors are expected to cancel out the observed score would be equal with the true score ($X = T$).

Systematic error in measurement:

Nenty (2015) validate that same amount of ability which an examinee or a group of examinees might share with others, anything that makes him/her differ in performance is a source of systematic error. A systematic error is associated with the fact that a measured value contains an offset or complete value. It is the component of error, remains constant in a specific manner on some other quantity. It is possible to be controlled by an examiner or group of examiners.

Systematic error is the difference between an observed value and the true value due to all other causes than sampling variability (Waller, Thompson & Wenk 2000). Systematic error arises due to discrepancies in the measurement scheme which is repeated at each time during measurement. In other words, if each time we administer a psychometric instrument, we do the same thing wrongly, our measurement will differ systematically from the correct result. The systematic error can be arise from;

➢ The characteristics of the tool,
➢ The measurement process,
➢ The participant's characteristics, (Campbell & Russo, 2001)

Some sources of systematic error are: (a) errors in the quality of the measuring instrument; for example, if there is no correct answer in a multiple choice item, all test takers will systematically get lower score than their actual scores (b) inappropriate testing conditions: for example; if there is loud traffic nearby, just outside the classroom where students are taking a test, this noise is liable to affect all the children scores, systematically lowering them (c) bias of experimenter: the experimenter might consistently read

the instructions of an instrument incorrectly, or might allow knowledge of the expected value of a result to influence the measurements (d) may just be an expression of different response styles (Weijters, Geuens & Schillewaert, 2010) or (e) can reflect an interaction of factors (Kim & Seltzer, 2011).

Although random errors can be handled more or less routinely, there is no prescribed way to deal with systematic errors. The main objective of psychological assessment procedure is to reduce the systematic error to a value smaller than the random error (Taylor, 1997). Previous research has shown that when respondents feel low intrinsic motivation to generate high quality data and perceive the cognitive costs of performing the process necessary for high quality answers as burdensome, they will compromise their standards, expend less energy, and therefore choose a satisfying response strategy (Krosnick,1999). Fatigue (mental or physical) is another potential source of systematic error in testing conditions. It can be defined as a psycho-physiological state resulting from sustained performance on cognitively demanding task and coinciding with changes in motivation, information processing and mood (Sanders, 1998).

Bergersen and Hannay (2010) argue that when fatigue exists on the part of the examinees, this has a systematic decrease in performance throughout the test, especially when achievement or abilities are examined. This situation is called 'fatigue effect'.

Systematic errors are the errors that can be controlled or managed, if not totally eliminated. Systematic errors often arise due to carelessness of examinees, selection of wrong instrument for measuring particular construct or trait or variable, utilization of wrong environment for testing, wrong instrument, poor items development, lack of validity and reliability of instrument, poor data collection process. Anything that is done by an examiner that he/she ought to have controlled prior to carrying out activities of assessment or measurement, anything that is left unattended to, thereby increasing or decreasing the score of some of the examinees is subject to error.

Error and continuous assessment:

The identification of error in measurement necessitated the adoption of continuous assessment in education. The repeated administration of the instrument would help in individual to obtain score that would be very close to the true score. If the same examination is given to the learner under the same conditions, it was presumed that the true would be equal to with the observed score (X=T). This is because, measurement is concerned with ascertaining the degree of the presence or absence of a trait.

Implication of error in decision making in learner's assessment:

The errors of measurement do not exist in the data until we introduce them, but once introduced, they play a crucial role (Livingston, 2004). Error affects the score obtained by the individual and as far as psychological measurement is concerned, one cannot rule out the error. Ofem and Anagbogu (2015) noted that error in measurement affects the learner in the following ways:

➢ It may limit the chances of a learner receiving the necessary counselling, for the learner who may be having personal, social and educational problems, if the score obtained are inflated or deflated as a result of error.

➢ It may refuse the chances of getting admission into tertiary institution, if the score does not reflect the true ability of the learner, thereby affecting the potential success of the individual in life.

➢ It may affect the possibility of a student being promoted to a new class, consequent upon the lack of validity which is a common error source for teacher-made test in most schools.

➢ It is present a different identity of an individual who previously may have been conceived to be incompetent, thereby limiting the chances of being awarded, admitted.

➢ Systematic error gives false information about the characteristics of an item; as the item may be presumed difficult or less difficult thereby necessitating good or bad response by the examinee.

Prospects for reducing systematic errors in learner's assessment:

It is evident that elimination of systematic error in measurement is difficult but by the use of following measures it could be reduces.

➢ Examination should be handled by test experts across all levels of instruction, especially in tertiary institutions where anything can be packaged and administered to student as aptitude test. Alternatively, calibrated for this examination should be submitted for scrutiny and validation before administration.

➢ Measurement experts and evaluators in tertiary institutions of learning should enhance efforts in ensuring that would- be- teachers are properly explained with the skills and abilities to develop test that could relatively be valid for learner assessment.

➢ To reduce error in human scoring of questions that cannot be scored by the computer, such as open response and essay questions, two or more scorers can score each item or essay. If they disagree, the item can be passed on to additional scorers.

➢ Differential assessment technique can be used by assessors in getting more comprehensive information concerning student's achievement and learning growth.

➢ Policy makers can lower or eliminate the consequences resulting from test result to minimize score inflation and reduce the motivation to manipulate the results.

Conclusion:

Measurement is an important element in the teaching and learning process. This is because, it provides us the quantitative information that is used to make decision about the process of the learner as well as determining ability of the learner. However, measurement in education is not error free. These errors are originating from different sources. Ethically, it would be wrong to base a decision on a faulty object. If it would be possible, one would have said that as longer as error is inherent in our measurement process, the efforts should be intensified to eliminate all forms of errors before decision would be taken based on the scores produced, because vastly is done with the scores obtained from the measurement. However, this is not possible. Therefore, the responsibility is on assessors and evaluators to reduce errors in

measurement as much as possible, so that, what is obtained is relatively close to the true score of the examinee and decision taken about the learners would almost be correct and certain.

Recommendations:

As per the suggestions made to eliminate systematic error and the conclusion, the recommendations made are as follows: researchers and teachers should try to minimize systematic error in the assessment of learners. Any time errors are discovered or noticed in the scores of learners, decision should not be taken learner based scores. Only teachers with appropriate skills should be involved in test construction in order to objectively produce reliable and valid test result for making right judgement on the learners. Finally, testers/examiners should ensure that test situations and variables are well planned to meet standard conditions in order to reduce the errors if not completely eliminated.

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Itroduction of different types of data Collection instruments

विभिन्न प्रकार के तथ्य संकलन के उपकरणों का परिचय

शोधकर्ता – वृजेश कुमार पारीक

नामांकन नम्बरः– 20110660102011

शोध–निदेशकः– डॉ. माधुरी दत्ता

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Abstract :

In any research work, it is considered essential to collect data for reaching scientific conclusions and for generalization and theory. There are only facts of Gudde and Haat, so the more the data (facts) according to one's experience dependent, pure and reliable, the more beneficial the research will be. Types of Data - Data can be divided into two parts. a . Primary data b. secondary data. Primary data are those data which are collected for the first time and the credit of collection goes to the researcher himself. There is a sense of originality in the secondary figures, because they are useful during research work, it is said that the figures are used for the second time. Types of Tests 1 Closed or Restricted Questionnaire 2 Restricted Questionnaire 3 Drawn Questionnaire 4 Mixed Questionnaire Research Equipment 1. Questionnaire Size I Questionnaire size can include all those instruments from which any type of information is being obtained. In this there are questions or statements etc., whose answers are given by the members of the sample. The tools of this class are as follows (i) Questionnaire (ii) Schedule (iii) Marking list (iv) Assessment scale (v) Mark sheet 2 Observation 3. Interview 4. Psychological test: Use of the following psychological tests for psychological and educational research (i) Achievement Test (ii) Intelligence Test (iii) Aptitude Scale (iv) Personality Table

1. प्रस्तावना :–

तथ्य संकलन शोध प्रक्रिया का एक महत्वपूर्ण चरण है। शोध में प्रस्तावित अध्ययन विषय से संबंधित तथ्य संबंधित सूचनाएं जानकारियां इनको एकत्र करने कि आंकड़ों का संकलन या तथ्यों का संकलन कहलाता है। इस प्रकार आंकड़ों के संकलन से अभिप्राय उन समस्त तथ्यों अथवा सूचनाओं को एकत्र करने से है, जिन्हें विभिन्न विधियों के अंतर्गत प्राथमिक अथवा वित्तीय स्रोतों से प्राप्त किया जाता है। किसी भी शोध कार्य में वैज्ञानिक निष्कर्ष तक पहुंचने एवं सामान्य करण एवं सिद्धांत करण हेतु आंकड़ों का संकलन अनिवार्य माना गया है।

2. आंकड़ों का अर्थ :–

अनुसंधान के दौरान समंको को आंकड़ों को एकत्र करना ही समंक संकलन या तथ्यों का संकलन या आंकड़ों का संकलन कहलाता है। किसी भी अनुसंधान के लिए आंकड़ों लोगों को एकत्र करना अत्यंत आवश्यक है क्योंकि इसके अभाव में न तो शोध के निष्कर्ष निकाले जा सकते हैं और ना ही नियमों का प्रतिपादन किया जा सकता है। वास्तव में तथ्य या आंकड़े ही अनुसंधान की

आधारशिला होते हैं। गुडे तथा हाट के अनुसार एक अनुभव आश्रित सत्यापनिय अवलोकन ही तथ्य है अतः आंकड़े (तथ्य) जितने अधिक शुद्ध एवं विश्वसनीय होंगे अनुसंधान उतना ही अधिक लाभदायक होगा।

3. आंकड़ों के प्रकार :–

प्रत्येक शोध या विषय से संबंधित आंकड़े अत्यधिक विविधता पूर्ण होते हैं अतः आंकड़े गुणात्मक भी हो सकते हैं और मात्रात्मक भी हो सकते हैं इस प्रकार से कई बार आंकड़े स्वयं अध्ययन करता द्वारा क्षेत्रीय अध्ययन के द्वारा संकलित किए जाते हैं और कई बार या अन्य शोधकर्ताओं के द्वारा पहले से ही संचालित किए जाते हैं। अतः आंकड़ों को दो भागों में बांटा जा सकता –

1. प्राथमिक आंकड़े (Primary Data) :– प्राथमिक आंकड़े वे आंकड़े होते हैं जिन्हें किसी भी अनुसंधान में प्रारंभ से अंत तक नए सिरे से संकलित किया जाता है। प्रथम बार संकलित किए जाने के कारण ही इन्हें प्राथमिक आंकड़े का जाता है। इसी कारण यह मौलिक भी होते हैं इसी के संदर्भ में पी.वी. या कहते हैं ''सूचनाओं व आंकड़ों से जिनसे पहली बार संकलित किया गया हो जिनके संकलन का उत्तरदायित्व शोधकर्ता या अन्वेषण कर्ता का अपना स्वयं का है। प्राथमिक आंकड़े वे आंकड़े हैं जो प्रथम बार संकलित किए जाते हैं और जिन्हें संकलित करने का श्रेय स्वयं अनुसंधानकर्ता को होता है।

2. द्वितीयक आंकड़े (Seconndary Data) :– वे आंकड़े होते हैं जो संबंधित शोध के पहले से ही किसी अन्य शोध कार्य में संकलित किए गए होते हैं। वर्तमान अनुसंधान के लिए महत्वपूर्ण और उपयोगी होने के कारण पुनः प्रयोग में लाए जाते हैं। पी.वी. यंग के अनुसार द्वितीयक तथ्य वे होते हैं जिन्हें भौतिक स्रोतों में एक बार प्राप्त कर लेने के पश्चात काम में लिया गया हो एवं जिन का प्रसारण अधिकारी उस व्यक्ति से भिन्न होता है। जिसमें प्रथम बार तथ्य संकलन को नियमित किया था। द्वितीयक आंकड़ों में मौलिकता का भाव होता है शोध कार्य के दौरान उपयोगी होने के कारण आंकड़ों का प्रयोग द्वितीय बार किया जाता है । अतः यह द्वितीयक समंक कहते हैं।

प्राथमिक एवं द्वितीयक आँकड़ों में अन्तर प्राथमिक

(1) प्राथमिक आंकड़ों का संकलन अनुसंधानकर्ता के द्वारा प्रथम बार किया जाता है। जबकि द्वितीयक आँकड़ो का संकलन पूर्व में ही कर लिया गया होता है और शोधकर्ता अपने शोधकार्य में महत्वपूर्ण होने के कारण इन्हें दुबारा प्रयोग में लेता है।

(2) प्राथमिक आँकड़े मौलिक होते हैं जबकि द्वितीयक आँकड़ों में मौलिकता का अभाव होता है।

(3) स्वयं अनुसंधानकर्ता के द्वारा संकलित किए जाने के कारण ये ऑकड़े विश्वसनीय हो है। जबकि द्वितीयक ऑकड़ों का संकलन पूर्व में ही कर लिया गया होता है अतः अनुसंधानकर्ता हेतु ये पूर्ण विश्वसनीय नहीं होते हैं।

(4) प्राथमिक ऑकड़ों को संकलित करने में अधिक श्रम धन व समय की आवश्यकता होती हैं। जबकि द्वितीयक ऑकड़े पूर्व में एकत्रित किए जा चुके होते हैं अतः इन्हें संकलित करने में अधिक धन, समय और श्रम की आवश्यकता नहीं होती है।

(5) प्राथमिक ऑकड़े अप्रकाशित होते हैं। जबकि द्वितीयक ऑकड़े कभी कभी प्रकाशित भी होते हैं।

(6) प्राथमिक ऑकड़े नवीन होते हैं। जबकि द्वितीयक ऑकड़ों में नवीनता का अभाव होता है।

प्रश्नावलियों के प्रकार (Types of Questionnaire)

1 बंद अथवा प्रतिबंधित प्रश्नावली (Closed Questionnaire)

2 प्रतिबंधित प्रश्नावली (Open Questionnaire)

3 चित्रित प्रश्नावली (Pictorial Questionnaire)

4 मिश्रित प्रश्नावली (Mixed Questionnaire)

वास्तव में अनुसन्धान समस्या से आरम्भ होता है तथा परिकल्पना की प्रकृति के उपकरणों का निश्चय होता है। हर समस्या के लिए हर उपकरण उपयुक्त नहीं होता बल्कि प्रत्येक उपकरण एक विशेष प्रकार के ऑकड़े (कंजं) एकत्र करने के लिए होता है। कभी–कभी किसी समस्या के समाधान के लिए ऑकड़े एकत्र करने में अनेक उपकरणों का उपयोग करना पड़ जाता है। अतः अनुसन्धानकर्त्ता के लिए आवश्यक है कि उसे उपकरणों, विधियों एवं यन्त्रों का व्यापक ज्ञान हो। उसे इस बात का भी ज्ञान होना चाहिए कि इन उपकरणों से किस प्रकार के ऑकड़े प्राप्त होंगे, उनकी क्या विशेषतायें एवं सीमायें हैं ? किन अवधारणाओं पर इनका उपयोग आधारित है तथा उनकी विश्वसनीयता, वैधता एवं वस्तुनिष्ठता क्या है ? इसके साथ ही उसमें उपकरणों के बनाने, प्रयोग करने तथा उससे प्राप्त ऑकड़ों का विश्लेषण करने का कौशल भी होना चाहिए।

4. अनुसंधान के उपकरण (Tools of Research)

न्यादर्श के अतिरिक्त अनुसंधान के लिए अगर लिखित उपकरण हो सकते हैं:–

4.1.. परिपृच्छा आकार (Inquiry Form)–

परिपृच्छा आकार में वे उन सभी उपकरणों को सम्मिलित किया जा सकता है जिनसे किसी प्रकार की जानकारी प्राप्त की जा रही हो। इसमें प्रश्न या कथन आदि होते हैं, जिनके उत्तर न्यादर्श के सदस्य देते हैं। इस वर्ग के उपकरण निम्नलिखित हैं

(प) प्रश्नावली (Questionnaire) (ii) अनुसूची (Schedule) (iii) चिन्हांकन सूची (Check List)

(पअ) निर्धारण मापनी (Rating Scale) (अ) प्राप्तांक पत्र (Score Card)

4.2. अवलोकन (Observation)

4.3. साक्षात्कार (Interview)

4.4. मनोवैज्ञानिक परीक्षण (Psychological Testing)—

मानसिक योग्यताओं का अध्ययन करने के लिए अनुसन्धानकर्ता को मनोवैज्ञानिक परीक्षणों को उपकरण के रूप में प्रयोग करना पड़ता है। मनोवैज्ञानिक तथा शैक्षिक अनुसन्धान के लिए निम्न मनौवैज्ञानिक परीक्षणों का प्रयोग किया जा सकता है

(i) उपलब्धि परीक्षण (Achievement Test) (ii) बुद्धि परीक्षण (Intelligence Test)

(iii) अभिवृत्ति–मापनी (Attitude Scale) (iv) व्यक्तित्व–तालिका (Personality Inventory)

बोगार्डस (Bogardu) के अनुसार प्रश्नावली विभिन्न व्यक्तियों को उत्तर देने हेतु दी गई प्रश्नों की एक तालिका है। यह निश्चित प्रमाणीकृत परिणामों को प्राप्त करती है जिनका सारणीकरण किया जा सकता है और सांख्यिकीय उपयोग भी किया जा सकता है।''

पी० वी० यंग (P- V- Young) ने प्रश्नावली को परिभाषित करते हुए लिखा है कि ''समाज वैज्ञानिक प्रधानतया प्रश्नावली का उपयोग माप योग्य सामाजिक घटना के अध्ययन के एक सहायक उपकरण के रूप में करते हैं।''

अनुसूची की परिभाषा (DEFINITION OF SCHEDULE)

गुडे और हैट (Goode and Hatt) के अनुसार–''अनुसूची प्रायः प्रश्नों के एक समूह के के लिये प्रयुक्त किया गया नाम है, जो साक्षात्कारकर्त्ता द्वारा दूसरे व्यक्तियों के आमने सामने की स्थिति में पूछे और भरे जाते हैं।''

बोगार्डस (Bogard) के अनुसार–''अनुसूची संक्षिप्त प्रश्नों की एक रचना है जिसे सामान्यतया सर्वेक्षणकर्त्ता स्वयं रखता है। अपने अन्वेषण के अग्रसर होने के साथ–साथ भरता है।

पी० वी० यंग (P- V- Young) के अनुसार–''अनुसूची औपचारिक तथा मानक अनुसंधानों में प्रयोग किये जाने वाला एक ऐसा उपकरण है, जिसका प्रमुख उद्देश्य बहुस्तरीय गणनात्मक आँकड़े संकलन करने में सहायता प्रदान करना है।''

अनुसूची के प्रकार (Types of Schedules)

पी० वी० यंग (P- V- Young) ने अनुसूची को निम्न प्रकारों में विभाजित किया है

(1) अवलोकन अनुसूची (Observation Schedule)

(2) मूल्यांकन अनुसूची (Rating Schedule)

(3) प्रलेख अनुसूची (Documentary Schedule)

(4) संस्था सर्वेक्षण अनुसूची (Institute Survey Schedule)

(5) साक्षात्कार अनुसूची (Interview Schedule)

(1) अवलोकन अनुसूची (Observation Schedule)– इस प्रकार की अनुसूची का सृजन उस समय किया जाता है जब अवलोकन प्रविधि (व्हेमतअंजपवद ज्मबीदपुनमद्ध का प्रयोग किया जाता है। इसमें प्रश्नों की सूची न होकर विषय सम्बन्धी कुछ बातें होती है जो अवलोकन के समय मार्गदर्शन हेतु प्रयोग में लायी जाती हैं।

(2) मूल्यांकन अनुसूची (Rating Schedule)– इस प्रकार की अनुसूची का प्रयोग उत्तरदाताओं की प्रवृत्ति, राय, मनोवृत्ति, पसन्द आदि अमूर्त और गुणात्मक तथ्यों का परिमाणात्मक रूप देने के लिये किया जाता है।

(3) प्रलेख अनुसूची (Documentary Schedule)–प्रलेखों से सम्बन्धित सूचनाओं को प्राप्त करने के लिये इस प्रकार की अनुसूची का प्रयोग किया जाता है। इन प्रलेखों में आत्मकथा डायरी, सरकारी एवं गैर सरकारी अभिलेख प्रमुख हैं।

(4) संस्था सर्वेक्षण अनुसूची (Institute Survey Schedule)– इस प्रकार की अनुसूची का प्रयोग संस्थात्मक समस्याओं के अध्ययन के लिये किया जाता है। पी० ची० यंग का कथन है–इन अनुसूचियों की रचना किसी प्रस्तुत संस्था के सम्मुख या पूर्व प्राप्त समस्याओं की जानकारी के लिये की जाती है।''

(5) साक्षात्कार अनुसूची (Interview Schedule)–इस प्रकार की अनुसूची का निर्माण साक्षात्कार विशेष को कुशलतापूर्वक संचालित करने के उद्देश्य से किया जाता है। सहायक सूचनाओं को प्राप्त करने के लिये एवं संकलित सूचना की परीक्षा के लिये भी यह अनुसूची उपयोगी होती है। इसके कारण साक्षात्कारदाता उत्तर कहानी पर वर्णन के रूप में न देकर सीमित व प्रासंगिक उत्तर देता है।

गुड और हैट (Goode and Hatt) की स्पष्टोक्ति का आशय है कि विज्ञानों के विकास का आधार व्यवस्थित अवलोकन ही है। अतः सामाजिक विज्ञानों की प्रगति हेतु सूक्ष्म एवं व्यवस्थित अवलोकन अत्यन्त आवश्यक है।

अवलोकन प्रणाली से तात्पर्य (Meaning of Observation Method)

मोसर के अनुसार–''अवलोकन को स्पष्ट रूप से वैज्ञानिक अन्वेषण की एक विशुद्ध प्रणाली कह सकते हैं।'' अवलोकन प्रणाली के माध्यम से संकलित तथ्यपूर्ण सामग्री, सदैव सामाजिक अनुसन्धान को स्वस्थ और सबल बनाती है। अतः इस पद्धति को तथ्यपूर्ण सामग्री के लिए व्यवस्थित पद्धति मान सकते हैं जिसके माध्यम से वास्तविकता का प्रत्यक्ष दर्शन किया जाता है।

अवलोकन प्रणाली, सामाजिक अनुसन्धान में विश्वसनीय एवं अर्थपूर्ण सामग्री प्रदान करने में सहायक है। इस पद्धति को वैज्ञानिक अनुसन्धान की शास्त्रीय पद्धति भी कहा जाता है। विभिन्न विज्ञानों जैसे भौतिक विज्ञान, प्राणि–विज्ञान, नक्षत्र विज्ञान, खगोल विज्ञान, भू–गर्भ विज्ञान आदि का विकास अवलोकन के आधार पर ही हुआ है। यह प्रणाली ऐसी प्रणाली है जिसमें अनुसन्धानकर्ता एवं रचनादाता के मध्य परस्पर परिचयात्मक सृष्टि बनी रहती है।

अवलोकन प्रणाली के प्रकार –

1. सरल अथवा अनियंत्रित   2. व्यवस्थित अथवा नियंत्रित

प्राप्तांक–पत्र (Score Card)

        प्राप्तांक–पत्र निर्धारण मापनियों में सबसे अधिक उपयोगी तथा व्यापक उपकरण है। इसके अन्तर्गत अधिक क्षेत्र को लेते हैं अर्थात् एक वस्तु अथवा व्यक्ति के अनेक पक्षों को साथ में लेते हैं। इस प्रकार प्राप्त पूर्णांक किसी वस्तु या व्यक्ति का मूल्यांकन करने में सहायक होता है। प्राप्तांक–पत्र को समुदायों की स्थिति के मूल्यांकन तथा भवन, विद्यालय, पाठ्य–पुस्तकों, स्वच्छता व्यवस्था, विद्यालय की धन व्यवस्था, अभिलेख, निर्देशन, व्यवस्थापन तथा माध्यमिक विद्यालयों के मूल्यांकन आदि में अत्यधिक प्रयोग करते हैं। किसी व्यक्ति या परिवार की सामाजिक अथवा आर्थिक स्थिति को जानने के लिए भी इस प्राप्तांक–पत्र का प्रयोग किया जाता है। प्राप्तांक–पत्र के अन्तर्गत निर्णायक को विस्तृत सामान्य स्तर की रूपरेखा दी जाती है। निर्णायक को एक समय में एक ही पक्ष का निर्धारण करना होता है और जब एक से अधिक निर्णायकों को लगा लेते हैं तो उनके प्राप्तांक को जोड़कर उनका औसत निकाल लेते हैं।

निर्धारण मापनी (Rating Scale)

        निर्धारण मापनी (Rating Scale) मूल्यांकन के क्षेत्र में व्यवहार में आने वाले अन्य उपकरणों में अत्यधिक प्रचलित है। यह मापनी अनुमति तथा निर्णय के मापन के लिए प्रयुक्त की जाती है। अनुमति तथा निर्णय किसी परिस्थिति, संस्था, वस्तु तथा व्यक्ति के सम्बन्ध में ज्ञात किया जाता है। अनुमति की अभिव्यक्ति मापनी पर की जाती है। वास्तव में यह मापनी द्विध्रुवी (Bi & Polar) होती है जिसमें गुणात्मक रूप ज्ञात किया जाता है। उदाहरण के लिए एक शिक्षक अपने छात्रों को अंक देने के लिए उनकी क्षमताओं के मापन के लिए इस मापनी (Rating Scale) का प्रयोग करता है। छात्रों की उपलब्धियों के लिए विभिन्न पक्षों का रेटिंग किया जाता है। इस मापनी का प्रयोग साधारणतः विशेषताओं तथा गुणों के मापन के लिए किया जाता है।

निर्धारण मापनी का अर्थ एवं परिभाषाएँ (Meaning and Definitions of Rating Scale)

गुड तथा स्केट्स (Good and Scates) के अनुसार यह उपकरण मूल्यांकन की जाने वाली वस्तु के विभिन्न अंगों की ओर ध्यान आकर्षित करती है, किन्तु इसमें उतने प्रश्न खण्ड नहीं होते जितने चेक लिस्ट अथवा स्कोर कार्ड में होते हैं।''

चिन्हांकन सूची (Check List)

अनुसूची को इस प्रकार तैयार करते हैं कि उसमें समस्या से सम्बन्धित अनेक चिन्ह के तथ्य, स्थिति तथा चर दिए होते हैं। चिन्हांकन सूची द्वारा यह जाँच की जाती है कि इसमें कौन–कौनसे अंग उपस्थित हैं। इनकी उपस्थिति अथवा अनुपस्थिति 'हाँ' / नहीं' से दिखा सकते हैं अथवा उसके पास सही का चिन्ह (अ) बना देते हैं। यह अत्यधिक सरल उपकरण है। इसके प्रयोग से कोई भी अंग छूट नहीं पाता। व्यवहार के निरीक्षण के लिए भी इसका प्रयोग किया जाता है। एक विशेष प्रकार की चिन्हांकन सूची को स्केल के रूप में भी प्रयोग करते हैं जिसमें अंक दिए जाते हैं। चिन्हांकन सूची की सबसे बड़ी विशेषता यह है कि इसके आधार पर तथ्यों को केवल अंकित करते हैं कोई मूल्यांकन नहीं करते। सर्वेक्षण, व्यक्ति इतिहास, व्यवहार तथा शिक्षा सम्बन्धी परिस्थितियों के अंकन के लिए चिन्हांकन सूची का प्रयोग सफलता के साथ किया जा सकता है, यथा–विद्यालय भवन, विद्यालय सम्पत्ति, भवन योजना, उपकरणों की पूर्ति, अधीक्षक के प्रतिवेदन का विश्लेषण, माध्यमिक विद्यालयों का संगठन एवं मूल्यांकन, राज्य में शिक्षा की सुविधा, कक्षा की शैक्षिक क्रियायें, पर्यवेक्षण तथा सफल शिक्षा के गुण आदि।

साक्षात्कार विधि (Interview Method)

साक्षात्कार सामग्री संग्रहण हेतु प्रयुक्त की जाने वाली सामाजिक अनुसन्धान की एक सर्वाधिक प्रचलित एक प्रत्यक्ष सम्पर्क प्रणाली है। इस प्रणाली का प्रारम्भ औद्योगिक समाज के उदय होने के साथ–साथ हुआ। इस प्रणाली में अनुसन्धान को कुछ ऐसी सुविधायें प्राप्त है जिसमें वह अपनी अध्ययन वस्तु के लिये मनुष्य के साथ वार्तालाप कर सकता है, उसकी इमओं और भावनाओं की जानकारी कर सकता है एवं अपने अध्ययन में मात्र अपनी ही इन्द्रियों पर आश्रित न रहकर अपनी अध्ययन वस्तु से सक्रियता भी ले सकता है। इसमें अभिनति एवं के आने की पूर्ण सम्भावना रहती है।

पी० बी० यग (P- V- Young) – ''साक्षात्कार को एक क्रमबद्ध प्रणाली माना जा सकता है जिसके द्वारा एक व्यक्ति दूसरे व्यक्ति के आन्तरिक जीवन में अधिक अथवा कप काल्पनिकता से प्रविष्ट होता है जो कि उसके लिये सामान्यतया तुलनात्मक रूप से अपरिचित है।''

हैट (Gossleand Hatt) विश्वसनीयता और विस्तार को तब तक पाया जा सकता है जब तक भास्तिक में यह स्पष्ट रूप से हो कि साक्षात्कार मूल रूप से सामाजिक प्रक्रिया का है।''

साक्षात्कार के उद्देश्य (Objectives of interview)

1 प्रत्यक्ष संपर्क द्वारा सूचनायें (Information through Direct contact)

2 उपकल्पना ओं का स्त्रोत (Source of Hypothesis)

3 व्यक्तिगत तथ्य (Personal Data)

4 गुणात्मक तथ्यों को प्राप्त करना (Information about Quality facts)

5 अतिरिक्त सूचनाएं (Additional informations)

मनोवैज्ञानिक परीक्षण (Psychological Test)

जॉन डब्ल्यू० बेस्ट (John W- Best) के अनुसार—मनोवैज्ञानिक परीक्षण एक उपकरण है जिसे मानव व्यवहार के किसी पक्ष के मापन एवं वर्णन के लिए तैयार किया जाता है।''

मनोविज्ञान तथा शिक्षा आदि सामाजिक विज्ञानों में अनुसन्धान के लिए आँकड़े प्राप्त करने के उपकरणों में मनोवैज्ञानिक परीक्षण सबसे अधिक उपयोगी है। इन परीक्षणों का उद्देश्य व्यक्तिगत भिन्नता, योग्यताओं, क्षमताओं तथा ज्ञानार्जन का मापन तथा वर्णन करना होता है।

उपलब्धि या निष्पत्ति परीक्षण (Achievement Test)

जिन परीक्षाओं की सहायता से विद्यालय में पढ़ाये जाने वाले विषयों तथा प्रदान की जाने वाली कुशलताओं में छात्रों की सफलता का ज्ञान प्राप्त किया जाता है वे निष्पत्ति परीक्षायें (।बीपबअमउमदज ज्मेज) कहलाती हैं।

फ्रीमैन (Freeman) के अनुसार—एक शैक्षणिक निष्पत्ति परीक्षण वह है जिसका निर्माण ज्ञान समूह में कौशल के मापन के लिए किया जाता है।''

हैनरी चौनसी (Henery Chauncy) के मतानुसार—प्रत्येक उपलब्धि परीक्षा में छात्रों को किसी न किसी रूप में अपने ज्ञान का इस प्रकार प्रदर्शन करना पड़ता है जिससे उसका अवलोकन और मूल्यांकन किया जा सके।''

उपलब्धि या निष्पत्ति परीक्षण निम्न प्रकार के होते हैं

(i) निबन्धात्मक परीक्षण (Essay type test) (ii) वस्तुनिष्ठ परीक्षण (Objective type test)

वस्तुनिष्ठ उपलब्धि परीक्षण (Objective Achievement Test)

निबन्धात्मक परीक्षणों के दोषों को दूर करने के लिए वस्तुनिष्ठ परीक्षणों (Objective Tests) का जन्म हुआ। सन् 1845 ई० में सर्वप्रथम होरासमैन (Horaceman) ने वस्तुनिष्ठ परीक्षण का निर्माण किया। गुड (Good) के अनुसार—''वस्तुनिष्ठ परीक्षा प्रायः सत्य–असत्य उत्तर, बहुसंख्यक चुनाव पूरक प्रश्नों पर आधारित होती है जिनका शुद्ध उत्तरों की सहायता से अंकन किया

जाता है। यदि कोई उत्तर तालिका के विपरीत होता है तो उसे अशुद्ध माना जाता है।'' वस्तुनिष्ठ परीक्षण में सम्पूर्ण पाठ्यक्रम को दृष्टि में रखते हुए मैकड़ों छोटे–छोटे प्रश्न होते हैं जिनका उत्तर भी अति संक्षेप में देना होता है। जैसे–हाँ, नहीं, सही, गलत, उपयुक्त, अनुपयुक्त या कोई निशान लगाना आदि। ये परीक्षण दो प्रकार के होते हैं।

1 प्रमापीकृत वस्तुनिष्ठ परीक्षण   (Standard objective test)

2 अध्यापक निर्मित वस्तुनिष्ठ परीक्षण   (Teacher made objective test)

वस्तुनिष्ठ परीक्षणों के प्रकार   (kinds of objective test)

1 सत्य असत्य परीक्षण   (True false test)

2 सरल पुन स्मरण परीक्षण   (Simple recall test)

3 पूरक परीक्षण   (Compilation test)

4 बहुसंख्यक चुनाव परीक्षण   (Multiple choice test)

5 मिलान परीक्षा   (Matching test)

बुद्धि परीक्षण (Intelligencetest)

मानव जीवन में बुद्धि अत्यधिक महत्त्वपूर्ण है। बुद्धि के बिना उसके व्यक्तित्व का विकास असम्भव है। बुद्धि के स्वरूप एवं अर्थ को समझने के लिए समय–समय पर मनोवैज्ञानिकों एवं शिक्षाविदों ने अपने विचार व्यक्त किए हैं और बुद्धि को निम्न समूहों में विभक्त किया है–

1. बुद्धि सामान्य योग्यता है – इस सम्बन्ध में कुछ मनोवैज्ञानिकों ने अपने विचार इस प्रकार व्यक्त किए है।

गल्टन (Galton) के अनुसार–''विभेद एवं चयन करने की शक्ति बुद्धि है।''

टरमैन (Terman) के मतानुसार– बुद्धि जन्मजात व्यापक मानसिक क्षमता है।''

स्टर्न (Stern) के कथनानुसार–नवीन परिस्थितियों में समायोजन करने की योग्यता ही बुद्धि है।''

2 बुद्धि दो या तीन योग्यताओं का योग है–इस विचारधारा को मानने वाले बिने (Binet) हैं। उनके अनुसार– बुद्धि तर्क, निर्णय एवं आत्म आलोचना की योग्यता है।''

प्रशासन पद्धति के आधार पर वर्गीकरण–

1. व्यक्तिगत बुद्धि परीक्षण

2. सामूहिक बुद्धि परीक्षण

3. विषय वस्तु के आधार पर बुद्धि परीक्षण

1 शाब्दिक बुद्धि परीक्षण   2. अशाब्दिक बुद्धि परीक्षण

व्यक्तित्व का मापन (Measurement of Personality)

वास्तव में व्यक्तित्व का मापन जीवन की विभिन्न परिस्थितियों में किसी न किसी रूप में हम सदैव करते रहते हैं। सामाजिक जीवन के अतिरिक्त उद्योग, व्यापार तथा कार्य 1 प्रधान क्षेत्रों में व्यक्तित्व को देख कर विभिन्न स्थानों के लिए व्यक्ति को नियुक्त किया जाता है। व्यक्तित्व मापन की दृष्टि से परीक्षण करके व्यक्तित्व के सन्तुलन या असन्तुलन का अनुमान लगाया जाता है। जिन व्यक्तियों के समायोजन में कठिनाई होती है, उनके व्यक्तित्व का अध्ययन तथा परीक्षण करने के पश्चात उपचार की दिशा निश्चित की जाती है।

महत्त्वपूर्ण प्रक्षेपी विधियाँ निम्नलिखित मानी जाती हैं

1. थेमेटिक एपरसेप्शन परीक्षा (Thematic Apperception Test)

2. रोर्शाक परीक्षा (Rorschach Test)

3. प्ले टेकनीक (Play Techniques)

4. शब्द साहचर्य परीक्षा (Word Association Test)

5. चित्र साहचर्य परीक्षा (Picture Association Test)

6. अभिनय प्रदर्शन परीक्षा (Dramatic Production Test)

व्यक्तित्व परीक्षणों को निम्न श्रेणियों में बाँटा जा सकता है

(प) आत्मनिष्ठ (Subjective)   (ii) वस्तुनिष्ठ (Objective)

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Data Collection Instruments : An Introduction.

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Abstract :

"*Research is an honest, exhaustive, intelligent searching for facts and their meanings or implications with reference to a given problem. The product or findings of a given piece of research should be an authentic, verifiable contribution to knowledge in the field studied.*"

- P.M.

Cook A research tool is an instrument that can be used to collect or obtain facts in the form of data, measure data and analyze data that is relevant to the subject of your research.

The format of a research instrument may consist of different tools of measurement and evaluation like questionnaires, surveys, interviews, checklists, or simple tests. The choice of which specific research instrument tool is decided on by the researcher. It is usually related to the actual methods that will be used in the specific study.

Research tools usually vary in complexity, interpretation, design, and administration. Each tool has its own uniqueness and is suitable for the collection of a certain type of information. The types of research instruments depend on the format of the research study being performed like qualitative, quantitative, or mixed methodology. For example, questionnaires are utilized when a study is more qualitative while a scoring scale in more quantitative studies.

The researchers felt a need for proper documentation of research tools and their categories as per the need of the different subjects of research.

The researchers of this research focus on identifying and analyzing the tools that can help in the data collection of research.

Keywords: Research tool, questionnaire, qualitative, quantitative, mixed methodology, surveys, checklist, interviews.

Introduction:

Different methodologies may be used for data collection and analysis. mostly methodologies are supported by an identical set of basic tools. These tools are listed during this research and are

described in short. The tools listed below will be used on their own or are applied as a part of wider methodologies. as an example, a survey might be designed and implemented as a standalone tool, but could even be implemented as a part of a wider methodology. Similarly, case studies or stories of change are often utilized in isolation, but can even be used as a part of a wider methodology

However, the fundamental tools listed below don't seem to be related to specific analysis methods. All may be analyzed by employing a range of various techniques and approaches. Some tools, like case studies or focus group discussions, are more often analyzed using qualitative techniques, whilst others, like surveys, tend to be analyzed quantitatively. But there are often exceptions to those rules.

Dimensions of research - Pure qualitative and pure quantitative

Pure Qualitative- Exploratory, Inductive, unstructured, open-ended, naturalistic, and free-flowing

Pure quantitative- Confirmatory, deductive, structured, close-ended, controlled, and linear.**[1]** Data collection is the process of gathering, measuring, and analyzing accurate data from a variety of relevant sources to find answers to research problems, answer questions, evaluate outcomes, and forecast trends and probabilities.**[2]**

A method of data collection is simply a technique that is used to collect empirical research data. It is how researchers "get" their information.

A researcher requires data gathering tools which may vary in their complexity, design, or interpretation. Each tool must be appropriate for the collection of a certain type of information.

There are many tools of educational research, few of them are: -

- ❖ Questionnaires
- ❖ Checklist
- ❖ Observation techniques
- ❖ Interviews
- ❖ Schedules
- ❖ Rating scales
- ❖ Psychological Tests

QUESTIONNAIRE: A **questionnaire** is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents.

This is the process of collecting data through an instrument consisting of a series of questions and prompts to receive a response from individuals it is administered to. Questionnaires are designed

to collect data from a group.**[3].** It constructs a self-report data collection instrument which is filled out by research participants.**[1].** It can be an effective means of measuring the behavior, attitudes, preferences, opinions and, intentions of relatively large numbers of subjects more cheaply and quickly than other methods. Questionnaires provide a relatively cheap, quick and efficient way of obtaining large amounts of information from a large sample of people as the researcher would not need to be present when the questionnaires are completed.**[7]**. Questionnaires helps to find out how satisfied participants are with an offering, how much they've learned, and whether they're actually acting on their new knowledge. Questionnaires with closed questions can be quickly evaluated in bulk; whereas questionnaires with open questions generally provide useful additional information.**[6].** Both open and closed questions are beneficial for collecting data as both quantitative and qualitative data can be obtained.**[7].**

Open Questions- These are asked when the researcher wants their respondents to express themselves in detail.

Closed Questions- These questions are asked when the researcher provides a limited set of options for the respondents to choose within.

Merits-

- Questionnaires are cost effective as it doesn't require the researcher to visit each respondent for data collection instead the researcher can use email, less expensive websites etc.

- It is not only restricted to a particular area, instead the researcher can collect data nationally and internationally.

- It creates less pressure on the respondent as it can be answered at any time according to their convenience.

- If respondents' responses are treated as confidential, personal information can often be obtained more easily through questionnaires. [8]

- A dept study can be done using a questionnaire as a preliminary tool for data collection.

Demerits-

- The data collected through questionnaires may be not completely reliable as the respondents may be careless or ignorant while answering some questions.

- It cannot be applicable for collecting data from illiterate people and children.

- When the questions are difficult to understand and interpret, they are unanswered.

- It doesn't allow us to interpret the respondents' emotional gesture to a particular question.

- The respondents may manipulate their responses while answering a questionnaire.

CHECKLIST:

A list of items to be noted checked or remembered.

It is the most effective means of observation. Users can utilize checklist lists to obtain information and make decisions about what they should know about the outcomes. They provide a method for collecting data on certain behaviors, knowledge, and abilities in a systematic manner. [9]

Merits-

- Checklists help us in faster data extraction.

- It helps in increasing our productivity.

- It gives a sense of motivation to achieve our goals.

- It gives a simple way to keep track of your observations [11].

- It's beneficial for assessing processes that can be broken down into a sequence of steps.[11]

Demerits-

- It has a limited use in qualitative research studies.[11]

- It does not indicate the quality of performance, so usefulness of checklist is limited.[11]

Observation Techniques:

Observational data is gathered by watching a person or thing do something. It's gathered by

methods including human observation, open-ended surveys, or the use of an instrument or sensor to monitor and record data, such as the usage of noise sensors.

Because observational data is recorded in real time, it would be extremely difficult, if not impossible, to recreate if it were lost.[10]

Observations can be overt (everyone is aware they are being watched) or covert (no one is aware they are being watched) (no one knows they are being observed and the observer is concealed). The advantage of covert observation is that when people are unaware that they are being watched, they are more likely to act naturally. However, due to ethical concerns, you will almost always need to undertake overt observations.

Direct or indirect observations are also possible. Direct observation is when you see interactions, processes, or behaviors as they happen, such as watching a teacher teach a lesson from a prescribed curriculum to see if they are following it exactly. Indirect observations are when you see the outcomes of interactions, processes, or behaviors, such as assessing the quantity of plate trash left by children in a school cafeteria to see if a new food is accepted. [12]

The following are the several sorts of observational methods:

- Controlled observation- It is a type of observation that is usually structured. Using a systematic approach, the researcher determines where the observation will take place, at what time, with which participants, and under what conditions.

- Naturalistic Observation - This technique entails observing individuals' spontaneous behavior in natural settings. The researcher merely takes whatever notes they can about what they see.

- Participant Observation- A variation of the above (natural observations), participant observation involves the researcher joining in and becoming a member of the group.**[13]**

Merits:

- Observations are one of the crucial components for forming the bases of hypothesis.

- All sciences, whether physical or social, use observations as a common method. As a result, it is very simple to follow and accept, and it is regarded as a universal method.

- For many areas, such as providing verbal information for behaviour, feelings activities, or simply because they cannot communicate, such as infants or animals, observation is the only appropriate tool.

- It necessitates less active participation and willingness on the part of responders.[14]

Demerits:

- Because observations are time-consuming operations, they result in a delayed study. [14]

- The researchers' personal bias influences their observations in a variety of ways. This also makes it difficult to make accurate generalizations. [15]

- Phenomenon like love, affection and feelings are abstract in nature hence, cannot be observed all the time.[16]

Interview:

The widespread format of an interview is where the interviewer asks the interviewee to answer a set of questions which are normally asked and answered verbally.

An interview is a conversation between two people, i.e interviewer, and the interviewee where questions are asked by the interviewer to obtain information from the interviewee.

Interviews are a tool mainly for the collection of qualitative data and are popular as a data-collection tool because of their flexibility.**[5].** Using this method for collecting the data, the interviewer establishes a rapport and asks the interviewee a series of questions. The interviewer must always remain nonjudgmental so as to reduce its potentially biasing effect.**[1]**

Different types of interview research instruments that may exist.

A structural interview- In structural interview there are a specific number of questions that are formally asked of the interviewee and their responses recorded using a systematic and standard method.

An unstructured interview- Unstructured interview is based on the same common theme of questions but here the person asking the questions (the interviewer) may alter the order the questions are asked in and the particular way in which they're asked.

A focus interview -It is one in which the interviewer will adapt their line or content of questioning based on the responses from the interviewee.

A focus group interview -It is one in which a group of volunteers or interviewees are asked questions to understand their opinion or thoughts on a specific subject.

A non-directive interview is one in which there are no specific questions agreed upon but instead the format is open-ended and more reactionary in the discussion between interviewer and interviewee.

Merits;

- It is a direct method of collection of data.

- Data collected with face-to-face contact with interviewee.

- Confidential information can be obtained.

- It can be written or oral type.

- Examination of known data.

- Knowledge of past and future can be derived.

Demerits:

- Information might be misleading.

- Biasness gets involved.

- Emotional interference

- Impact of differences of mental outlook of interviewee and interviewer.

SCHEDULE:

Schedule is a type of tool with is z combination of many questions set by the interviewer for purpose of interview, formulated with specific purpose of testing an assumption.

Merit:

- Samples can be large.

- Personality factors can be studied

- Face to face interaction with interviewee.

- Confusion regarding the questions can be resolved as face-to-face interaction happens

Demerits:

- Emotional impact.

- Biasness

- Subjective approach.

RATING SCALES:

Ratting is a phrase used to express one's opinion or judgement about a situation, an object, or a

person. Opinions are frequently expressed on a scale of values; rating procedures are tools for quantifying such assessments. It enables the respondents to measure their interests, perceptions, feelings, preferences etc.

Following are some types of Rating scales

Numerical Rating scale- It is the type of rating scale where the respondents need to send their feedback in the form of numeric values.

Likert Scale- It allows the respondents to express themselves in term of agree and disagree for a statement

Radio frequency scale- It is a type of rating scale that is used to measure the number of occurrences of an assertion or statement. It allows the researcher to know how often the respondent performs a particular action.

Star rating scale- It is a type of rating scale which enables the respondent to express his satisfaction or dissatisfaction by giving a number of stars.

Heart rating scale- It is the type of rating scale denoting ranked parameters, represented as hearts instead of check box or numbers.

Merits-

- Helps as a tool in finding the needs of students

- Stimulating effects on the rates

- It has wider range of application and can be used for tutor ratings, personality ratings,

school appraisal etc.

Demerits-

- Immediate emotional reactions may affect the ratings.

- There's no way to tell how much of a difference there is between each rating's levels of relevance.

- A rater's tendency to rate others in the opposite way (contrasting) from themselves or herself in a trait is known as the contrast error.

TESTS-

Tests help to collect Quantitative data in research. It is a systematic procedure for observing a person's behavior and describing it with the aid of a numerical scale or a category system. A Psychological Test is essentially an objective and standardized measure of a sample of behavior.**[4]**

Achievement Test: A test designed to measure the knowledge or proficiency of an individual in something that has been learned or taught. Eg: Arithmetic or Typing.

Aptitude Test: It assumes that individuals have inherent strengths and weaknesses, and are naturally inclined towards success and failure in certain areas based on their inherent characteristics. It is used to determine an individual's propensity to succeed in a given activity.

Intelligence Test: A standardized test used to establish an intelligence level rating by measuring a subject's ability to form concepts, solve problems, acquire information, reason and perform other intellectual operations.

Personality Test: A test usually involving a standardized series of questions or tasks used to describe or evaluate subject's personality characteristics.

Merits-

- In light of the flaws discovered, the tool's structure and contents are revised.

- Offensive, intrusive, or invasive inquiries are addressed as measurement issues.

- . Used for checking and evaluating thus providing students a border scope and higher objectivity.

Demerits -

- It may disclose the final answers to the students thus students tend to change their answers leading to solutions.

- It's possible that it's biased against certain types of test takers.

- It may be oversimplified and superficial

There are many complex instruments that can be used to collect data and analyze information. Mostly many if not all are based on the same core set of tools and methods described in this conceptual paper by the researcher. The above mentioned data collection tools allow us to build up strategies thus forming the bases of the research work.

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Development of Teaching Effectiveness Scale for Teachers Teaching ESL or EFL

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Abstract

Language teaching is called to be a foundation teaching because without learning the language effectively, the learner will not be able to learn and understand any subject. The second language also keeps same importance because the knowledge is found in many languages and the second language plays a role to be a bridge to reach the knowledge available in other languages. In India and many other countries, the English language is taught as second language (ESL) or a foreign Language (EFL). English is accepted as the most spoken language around the world either as first language or as the second language or as foreign language. Teachers who are teaching English as in India should competent to use it effectively otherwise the learners may not learn it as effectively as they need to be. We have developed an observation schedule for teachers who were teaching ESL or EFL in their respective classes. In this article, the procedure and steps of developing this observation schedule have been discussed.

Keywords- ESL, EFL, Observation Schedule

Introduction-

Far before from the independence, English has generally partaken in a decent status in India (Bhattacharyya, 2021), however it was disparaged similar to the language of the colonizer (Léglise & Migge, 2007). Researches show that India is the second biggest English talking country after the US (Masani, 2012). After India acquired its autonomy in 1947, the language issue was one of the significant subjects to examine prior to composing the constitution (Journals of India, 2019). The new constitution stated the pluralistic character of India both semantically and socially (The Economic Times, 2015). Subsequently, Article 343 of the Indian Constitution assigns Hindi as the authority language of the association, while English is to be utilized for all official association purposes for a time of 15 years (India Kanoon, 2012). Following 9 years of that date, the Official Language Commission of India proposed stretching out the utilization of English to turn into an "associate official language" or an "associate additional language" (Siwach, 1987). Thus, language plan in India had the character of being status-based as opposed to acquisition based. As the English has been a popular and most regarded language in India even before freedom, it could not be replaced by any lingua franca and the language politics in India made it the new lingua franca for the Indians to connect with each-other in various states to communicate.

In present days, the English language is taught in educational institutes as second language or as foreign language. As second language the English language is regarded as the bridge language between the people of different states of India and as a foreign language English language is regarded as the language to provide jobs and building career in foreign countries.

The teachers, who are teaching English language either as Second or foreign language must be competent as per the need of the present time. They should be trained properly and should be observed in a like manner. In India, the teachers in government institutions are recruited through a common test. These tests are not significant to confirm if the teachers are competent in English or not. To see if the teachers are competent in English language or not, a regular check or observation should be done within a particular interval and if found lack of competence, they should provide more training and refresher courses to their self-development as an ESL or EFL teachers. In our study, we have focused on this issue and developed an observation schedule for English language teachers.

Study of Related Literature-

Rizvi, (2010), in a study developed an observational schedule intended to assess the viability of a creative and logically critical teacher-training-program called the Cluster Based Mentoring (CBM) Model. In the quantitative examination of the observation schedule, information gathered during a pilot study has shown that the perception plaobservation schedule has high inner consistency. The basic t-test has shown that countless things show potential to differentiate. The qualitative part of the research yielded valuable data for additional upgrading the timetable's legitimacy and specialized quality.

Shahmohammadi, (2015) in a study proved the importance of teachers competence in languages. As per the research, language teaching is a muddled undertaking which requires adequate assets and capable educating; which thus, requires thinking about all mental, emotional, and social factors.

Allen, Frohlich, & Spada, (1984); Broughton, Brumfit, Flavell, & Hill, (1987); and Burns, (1999) also said in their researches that the teachers of languages, specially teaching english as a second or foreign language should be competent and fair towards the ethics and mprals f teaching and should do more efforts to be competent in it.

Above studies show that the teachers of English language shopuld be neither be competent, butalso their regular observation should be done to let them maintain their effectiveness and to prepare plans for their refreshers and training programs. In this research, we have prepared a detailed observation schedule for teachers who teach english in the classrooms. The plan and procedure is as under-

Procedure of Developing Observation Schedule-

We discussed with several English language teachers to know what dimensions and items should be inculcated in the observation schedule. All the opinions were taken seriously in relation to construct the observation schedule. After the discussion with intellects, the suggestions were noted down and an observation schedule was prepared for the English language teachers. The observation schedule comprise following dimensions-

1. The use of English in teaching and communication.
2. Instructional Strategies.
3. Classroom Management.
4. Student Engagement.
5. Curriculum Implementation.

The observation schedule was designed to observe the competence of teachers in English language. The scheduled was divided in five major Dimensions that decide the teacher's skill and style of teaching the subject in the classroom-

1. The use of English in classroom
2. Instructional strategies
3. Classroom Management
4. Student Engagement:
5. Curriculum Implication:

Each dimension had some of the points on which the observer has to observe the teacher and write the report. At primary level, these points were 27 in total.

Standardization-

After preparing the schedule at primary level; we presented the tool to the several intellects working in the field of education and research. They suggested some corrections in syntax and pattern of the tool. We incorporated all the corrections suggested by these intellects. At this level the points in all dimensions were 21 in total. The point wise detail is as under-

1. The use of English in classroom:

This Dimension is divided in two points-

- English for communication in general and
- English for instruction.

This part observes the teacher's use of English in the classroom for general communication and instructional purposes.

2. Instructional strategies:

This Dimension is divided in six points which are:
- Effectiveness in addressing or responding to problems or difficult questions/tasks.
- Crafting Good Questions.
- Using Variety of measurement.
- Adjusting lesson with students' individual level or needs.
- Providing alternative explanation and examples.
- Providing appropriate challenges for capable students.

3. Classroom Management:

This Dimension is divided in four points which are-
- Controlling disruptive behavior.
- Disruptions.
- Establishing classroom rules to keep activities run smoothly.
- Routines.

4. **Student Engagement:**

   This Dimension is divided in two points, which are-
- Promoting learners active engagement.
- Sustaining student's engagement.

5. **Curriculum Implication:**

   This Dimension is divided in seven points, which are-
- Preparation of the lessons.

- Contextualization of the instruction.

- Implementation of genre-based teaching.

- Stimulating inquiry among students.

- Providing model for the students.

- Promoting interaction among learners.

- Using authentic assessment to assess students' achievement

   Each point of every dimension is a benchmark and the observer has some options over it to decide whether the teacher is competent on that particular point or not. He has to tick on the given options against each point of observation in each dimension.

Validity:

   After corrections; we submitted the schedule before the intellects who were highly experienced in the field of research and teaching to put their valuable remarks on the face validity of the tool, As per their opinion the observation schedule found to be valid.

   Norms:

   The observation schedule has been prepared to observe teachers of English Language. The observer shall go in the classroom while the teacher is teaching English language and sit behind very quite. He/she will observe the activities of the teacher and put a check (√) mark against the activities the teacher is exactly doing. These activities are given in three categories i.e. 'Low', 'Average' and 'High'.

Conclusion-

   This observation schedule was developed for determining teachers' competence level in English language. No marks are given at any points and hence, no quantitative analysis is possible. If the observation is done for more than one teacher, it may be counted that how many teachers were found to be at 'low', 'average', or 'high' level of competence in English language. After observation the observer will opine the competence level of the teacher under five categories. The teacher may be high in some categories, average in other categories or may be 'Low' in his performance on different dimensions. We hope this tool will be helpful in diagnosing the teachers problems behind teacher's competence in language and also to prepare plans for their training programs.

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सामाजिक अनुसंधान (Social Research)

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प्रस्तावना :–

सामाजिक अनुसंधान (Social Research) का समाजशास्त्रा में एक विशेष महत्त्व है। समाज में घटने वाली क्रियाओं के व्यवस्थित अध्ययन के लिए सामाजिक अनुसंधान की विधि को लेकर कई मत व्यक्त किए गए हैं। कुछ समाजशास्त्रियों ने यह महसूस किया कि समाजशास्त्रा में सामाजिक अनुसंधान को विधिवत स्थापित करने के लिए विज्ञान में अपनाये गयी विधि का प्रयोग काफी उपयोगी हो सकता है। वह दूसरी ओर समाजशास्त्रा के कुछ ऐसे भी विचारक थे, जिन्होंने इस मत का खंडन करते हुए यह बताया कि सामाजिक शोध की विधि विज्ञान से भिन्न होनी चाहिए। जिन लोगों ने विज्ञान के विधि को उत्तम मानकर सामाजिक अनुसंधान पर जोर दिया उनमें फ्रांस के समाजशास्त्री अगस्त काम्ट, इमाइल दूखखम के नाम मुख्य रूप से लिये जाते हैं।

सामाजिक अनुसंधान की प्रकृति (Nature of Social Research) :–

सामाजिक अनुसंधान के प्रकृति की व्याख्या करते हुए अगस्त काम्ट (1798–1857) का विचार था कि जिस प्रकार प्रकृति विज्ञान में तथ्यों का विश्लेषण वैज्ञानिक विधि के द्वारा किया जाता है उसी प्रकार सामाजिक क्रियाओं का अध्ययन भी समाजशास्त्रा में वैज्ञानिक विधि को अपनाकर सामाजिक शोध करना संभव है। काम्ट के अनुसार सामाजिक अनुसंधान के निम्न चार विधि का अनुसरण करना आवश्यक है–

a. निरीक्षण (Observation)
b. प्रयोग (Experiment)
c. तुलनात्मक विधि (Comparative Method)
d. ऐतिहासिक विधि (Historical Method)

निरीक्षण (Observation): निरीक्षण का सीधा संबंध सामाजिक क्रियाओं के अवलोकन से है। इस विधि का प्रयोग हमारे ज्ञानेन्द्रियों के इस्तेमाल से जुड़ा है। घटनाओं को हम अपने आँखों से देखकर उस घटना, क्रिया तथा प्रक्रिया के बारे में अनुमान लगाते हैं। जिन तथ्यों का अवलोकन नह किया जा सके उसे विज्ञान की कसौटी पर विश्वसनीय नह माना जा सकता है। इसलिए निरीक्षण को सामाजिक अनुसंधान का एक महत्त्वपूर्ण अंग माना जाता है।

<u>प्रयोग</u> (Experiment): प्रयोग विधि का इस्तेमाल यद्यपि विज्ञान में विशेषकर पदार्थ विज्ञान, रसायन विज्ञान तथा जीव विज्ञान में प्रयोगशाला में नियंत्रित वातावरण में किया जाता है। समाजशास्त्रा में विज्ञान के स्तर का प्रयोग संभव नह   हो सकता। इसलिए यह कहा जाता है कि समाज विज्ञान में प्रयोग करना तथा प्रकृति विज्ञान में प्रयोग किया जाना अलग स्थिति को दर्शाते हैं। समाजशास्त्रा में प्रयोग से तात्पर्य कारक तत्त्वों के नियंत्राण से है। उदाहरण के लिए एक गाँव में परिवार नियोजन की सफलता के लिए उस गाँव को परिवार नियोजन पर आधारित फिल्म व उससे संबंधित जानकारी दी जाए और दूसरे गाँव को इससे वंचित रखा जाये तो यह एक प्रकार के नियंत्राण की प्रक्रिया मानी जायेगी।

<u>तुलनात्मक विधि</u> (Comparative Method): तुलनात्मक विधि का इस्तेमाल अक्सर विज्ञान में मानव समाज और प्राणी जगत के बीच तुलना के द्वारा किया जाता है। समाजशास्त्रा में तुलनात्मक विधि का प्रयोग परंपरागत समाज और आधुनिक समाज जिसे ग्रामीण तथा शहरी समाज कहा जाता है – के लिए किया गया। एक ही समाज की तुलना दो विभिन्न समय तथा काल के संदर्भ में भी की जा सकती है। इतिहास के संदर्भ में ही एक समाज का अध्ययन दो विभिन्न समय को ध्यान में रखकर किया जाता है। मुगल काल तथा ब्रिटिश काल के समय समाज के स्वरूप में काफी अंतर पाया जाता है। इस प्रकार समाजशास्त्रा में भी तुलनात्मक विधि का प्रयोग कर महत्त्वपूर्ण निष्कर्ष निकाले जाते हैं।

<u>ऐतिहासिक विधि</u> (Historical Method): ऐतिहासिक विधि से काम्ट का तात्पर्य समाजशास्त्रा में सिद्धान्त प्रतिपादित करने से था। मानवीय विचारों में जो बदलाव आते हैं उस बदलाव का अध्ययन समाज को आधार मानकर किया जा सकता है। यद्यपि काम्ट ने इस विधि का प्रयोग सीमित स्तर पर किया था परंतु सामाजिक अनुसंधान के लिए इसका वृहत स्तर पर प्रयोग कर महत्त्वपूर्ण उपकल्पनाएं बनाये जा सकते हैं।

<u>सामाजिक अनुसंधान का विषय क्षेत्र</u> (Scope of Social Research) :-

सामाजिक अनुसंधान के अध्ययन क्षेत्र की बात को लेकर साधारणतया यह सवाल उठाया जाता है कि सामाजिक अनुसंधानकर्त्ता कितने तथ्यों की जानकारी शोध द्वारा करते हैं? किन अवधारणाओं और अनुमानों पर वे अपने शोध का आधार बनाते हैं? शोध का प्रयोजन क्या होता है? क्यों शोध किये जाते हैं? क्या शोध के बिना तथ्यों की जानकारी संभव है? अगर इन सवालों को ध्यान में रखकर चर्चा की जाये तो संभवतः शोध का क्षेत्रा इतना व्यापक हो जाये कि उसका वर्णन करना थोड़ा कठिन प्रतीत हो। इसलिए शोध से संबंधित इसके विषय क्षेत्रा का वर्णन कुछ मौलिक बातों को ध्यान में रखकर ही किया जाना ज्यादा उचित होगा।

सामाजिक अनुसंधान में अवधारणा (Concept in Social Research) :–

किसी भी सामाजिक अनुसंधान में अवधारणा का अपना अलग महत्व होता है। शोधकर्ता तथ्यों के अवलोकन तथा संकलन कर उन तथ्यों को शब्दों के द्वारा अभिव्यक्त करना चाहता है। तथ्यों की वैज्ञानिक अभिव्यक्ति के लिए अवधारणाओं की मदद ली जाती है। ये अवधारणाएं एक सोचने की अमूर्त प्रक्रिया है जिसके द्वारा घटनाओं व तथ्यों का वर्णन हो पाता है। अवधारणाओं की मदद से किसी घटना, प्रक्रिया या तथ्य का संक्षेप में वर्णन संभव हो पाता है। गुडे तथा हाट ने इसलिए अवधारणा को एक तार्किक मानवीय सोच की प्रक्रिया बताया है जो हमारे सोचने समझने की नैसर्गिक प्रक्रिया है। यह हमारे ज्ञान व सोच की एक मानसिक तथा अमूर्त प्रक्रिया है जिसका महत्व सिद्धान्त के संदर्भ में कॉफी महत्वपूर्ण हो जाता है। तथ्य की तरह ही यह एक अमूर्त प्रक्रिया है। जब शोधकर्ता तथ्यों में अन्तः सम्बन्ध को देखता है अथवा एक निश्चित घटना या व्यवहार प्रतिमान को वह पृथक करने में सफल होता है तो वह उस सम्पूर्ण स्थिति को अति संक्षेप में एक दो शब्द की सहायता से अभिव्यक्त करने का प्रयास करता है। तथ्यों के एक वर्ग की इस संक्षिप्त अभिव्यक्ति को ही विज्ञान में अवधारणा (Concept) कहा जाता है। पी0वी0 यंग ने लिखा है कि तथ्यों (data) के प्रत्येक नए वर्ग को, जिसे कि अन्य वर्गों से कुछ निश्चित विलक्षणताओं के आधार पर अलग कर लिया गया हो, एक नाम या एक लेबल दे दिया जाता है जो कि अवधारणा कहलाता है। वास्तव में एक अवधारणा तथ्यों के एक वर्ग या समूह की एक संक्षिप्त परिभाषा हैं। 'कक्षा पलायन' (Truancy) 'संस्कृति', 'नेतृत्व', 'समाज' आदि अवधारणाओं के ही उदाहरण हैं। अवधारणाओं के कुछ परिभाषा को द्वारा समझना आवश्यक है। सैरैग (Scharag) के अनुसार, 'अवधारणाएँ व शब्द या संकेत होते हैं जो सिद्धान्त की शब्दावली प्रदान करते हैं एवं उसकी विषयवस्तु को बतलाते हैं'। अर्थात् सिद्धान्त के अभिव्यक्ति का एक उत्तम जरिया है अवधारणा। फेचरचाइल्ड ने भी इसी बात को वैज्ञानिक संदर्भ द्वारा जोड़कर देखा है। उनके अनुसार ''अवधारणाएँ वे विशिष्ट मौखिक संकेत हैं जो कि वैज्ञानिक निरीक्षण व चिन्तन के आधार पर निकाले गए सामान्यीकृत (generalized) विचारों को दिए जाते हैं।''

सामाजिक अनुसंधान में उपकल्पना (Hypothesis in Social Research) :–

किसी भी शोध व अनुसंधान को एक सही निर्देश व आधार प्रदान करने के लिए एक सैद्धान्तिक आधार उसका प्रारूप होना आवश्यक है। उपकल्पना एक ऐसी ही स्थिति है जो शोधकर्ता को खोज करने से पूर्व कुछ अनुमान वा कुछ वैज्ञानिक सोच को आधार मानकर काम करने के लिए प्रेरित करता है। अगर हम किसी व्यक्ति को देखते हैं कि वह जमीन में एक सीमित क्षेत्रा को खोद रहा है तो संभव है वह यह मानकर चल रहा हो कि कुछ दूर तक खुदाई करने के पश्चात उसे पानी मिल जाये। अर्थात उद्देश्यविहिन कार्य करना वैज्ञानिक विधि का कारण नहीं है। कुछ कार्य उद्देश्य को ध्यान में रखकर किये जाते हैं। संभव है हमारा अनुमान सच हो या फिर वह गलत भी हो सकता है। जंगल में धुआँ उठते देख या रोशनी को देखकर यह अनुमान लगाया जा सकता है कि धुआँ उठने

वाले जगह पर या रात में जहाँ रोशनी हो रही है वहाँ कुछ लोग बसते हों। वहाँ एक कस्बा होगा जहाँ कुछ लोगों से मिलने की संभावना बनती लें

शैक्षिक अनुसंधान की प्रस्तावना :–

शैक्षिक अनुसंधान से तात्पर्य उस अनुसंधान से होता है, जो शिक्षा के क्षेत्र में किया जाता है। उसका उदेश्य शिक्षा के विभिन्न पहलुओं, आयामों, प्रक्रियाओं आदि के विषय में नवीन ज्ञान का सृजन, वर्तमान ज्ञान की सत्यता का परीक्षण, उसका विकास एवं भावी योजनाओं की दिशाओं का निर्धरण करना होता है। ट्रैवर्स ने शिक्षा–अनुसंधान को एक ऐसी क्रिया माना है, जिसका उदेश्य शिक्षा–संबंधी विषयों पर खोज कर के ज्ञान का विकास एवं संगठन करना होता है। विशेष रूप से छात्रों के उन व्यवहारों के विषय में ज्ञान एकत्र करना, जिनका विकास किया जाना शिक्षा का धर्म समझा जाता है, शिक्षा–अनुसंधान में अत्यन्त महत्त्वपूर्ण समझा जाता है। ट्रैवर्स के अनुसार, शिक्षा के विभिन्न पहलुओं के विषय में संगठित वैज्ञानिक ज्ञान–पुंज का विकास अत्यन्त आवश्यक है, क्योंकि उसी वे शिक्षा अनुसंधान की प्रति स्वयं सीखने की सामग्री आधार पर शिक्षक वे लिए यह निर्धारित करना संभव होता है कि छात्रों में वांछनीय व्यवहारों वे विकास हेतु किस प्रकार की शिक्षण एवं अधिगम परिस्थितियों का निर्माण करना आवश्यक होगा। शिक्षा वे क्षेत्रा में शैक्षिक अनुसंधन का महत्त्वपूर्ण स्थान है। शिक्षा की प्रमुख समस्या है कि उसकी प्रक्रिया को सुदृढ़ प्रभावशाली एवं सशक्त वैफसे बनाया जाए। इस समस्या वे समाधन हेतु अनुसंधान की आवश्यकता है। मौलिक अनुसंधनों से ज्ञानक्षेत्रा में वृष्टि की जाती है। प्रयोगात्मक शोध्कार्यों से नवीन सिद्धांतों तथा नियमों का प्रतिपादन किया जाता है। क्रियात्मक अनुसंधन की संकल्पना का जन्म स्टीपफन एम. कोरे वेफ विचारों में हुआ। विद्यालयों वेफ समक्ष उस समय अनेक समस्याएँ थीं जिनवेफ समाधन उपलब्ध नहीं हो पा रहे थे। उस समय स्टीपफन एम. कोरे की पुस्तक 'एक्शन रिसर्च टू इम्प्रूव स्कूफल प्रैक्टिस' ने इन समस्याओं वेफ समाधन की दिशाएँ सुझाई थीं। यही सुझाव क्रियात्मक अनुसंधन कहलाया। क्रियात्मक अनुसंधन एक ऐसी प्रक्रिया है जिसवेफ द्वारा किसी क्षेत्रा वेफ कार्यकर्ता अपनी समस्याओं का वैज्ञानिक ढंग से अध्ययन करवेफ, उसका मूल्यांकन करते हैं।

शैक्षिक एवं सामाजिक अनुसंधान में परिणामों की व्याख्या एवं मापन के तरीके :–

- मौलिक अनुसंधान
- व्यावहारिक अनुसंधान
- परिणात्मक अनुसंधान
- गुणात्मक अनुसंधान
- ऐतिहासिक अनुसंधान
- क्रया अनुसंधान
- घटनोत्तर अनुसंधान
- सर्वेक्षण अनुसंधान
- लम्बात्मक अनुसंधान

Introduction to Data Collection Instruments

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Abstract

Discovery and research have been two potent weapons in the hands of human beings for knowing the secrets of nature and getting adjusted to physical and social environment. Research is a careful investigation or inquiry especially through search for new facts in any branch of knowledge. It is a well thought scientific process involving some systematic and definite steps for arriving at something new or adding modifications to existing stock of knowledge helpful in solving the problems being confronted. Data collection is one of the most important steps of research process. It play an important role while conducting research.

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses and evaluate outcomes. In this present paper the researcher will explain the concept of research and data collection and different data collection tools or instruments which can be used for quality collection of evidences and information in the form of data.

Concept of Research :

The word "Research" means searching again or to search for something or bringing modification to existing ones. Research is a part of our daily routine like for example, a housewife may try to know what combination of sugar, salt or food contents make a dish more delicious or a teacher may try to find out the best strategy or technique of teaching her students. Research is the defined as the systematic and objective analysis and recording of controlled observation that may lead to the development of generalization, principles or theories, resulting in prediction and possibly ultimate control of events. It is a well thought scientific process which involve some definite steps for arriving new or adding modification to the existing stock of knowledge helpful in solving the problems being confronted (**Best and Kahn**)

According to **Young**, "Research is the systematic method of discovering new facts or verifying the old facts, their sequence, interrelationships, causal explanation and the natural laws which governs them."

According to **Kothari**, " The term research refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analysing the facts and reaching certain conclusions either in the form of solution(s) towards the problem concerned or in certain generalizations for some theoretical formulations."

Research originates with a question or problem, needing to be defined clearly by finding out its proper solution stated in terms of laid down research objectives. It then follows a well thought, systematic

specific procedure by accepting certain assumptions, tentative solutions or an educated guess in the form of laid down hypotheses for getting them tested through the collected information, or controlled observations leading to some specific, objective , reliable and valid generalizations.

Concept of Data Collection:

Data is the lifeblood of research as it connects all the ideas that we need about the world to practice the world. It makes research empirical which means that it represents something outside our opinions and ourselves. Research data is any kind of information that has been collected, observed, generated or created to validate original research findings. It is a set of values of subjects with respect to qualitative or quantitative variables. Data is a raw , unorganized facts that need to be processed. Data collection is the process of gathering and measuring information on variables of interest, in an established systematic pattern that enables one to answer stated research questions, test hypothesis and evaluate outcomes. It is a systematic appraoch to accurately collect information from various sources to provide insights and answers to research questions, testing a hypothesis or evaluating an outcome. The Data Collection component of research is common to all fileds of study including physical and social sciences, humanities, business etc. While methods can vary by discipline still the emphasis is on ensuring accurate and honest collection of data. The main purpose of data collection is to gather quality information that can be analyzed and used to support decisions or provide evidences. The ultimate goal for all data collection is to capture qulaity evidences that then translates to rich data analysis and allows the building of a convincing, credible and authentic answer to questions that have been passed. Accurate data collection is essential for maintaining the integrity of research

Data collection is one of the most important stages in conducting research. After selection and definition of the research problem, setting up of the objectives and hypothesis of the study and making up the decision of the participants or subjects of the study, the researcher has to focus on collection of the related information about the research problem or evidences for the verification of his hypothesis which may answer the researchers' questions. The research problem cannot be solved and the research questions cannot be answered without help of the needed information and evidences collected or gathered by the researcher. These collected evidences or information are helpful in answering the research questions are known by the tern data and the techniques or tools or instruments employed for collecting the data are called data collection tools or instruments.

There are two kinds of data collected which include quantitative and qualitative data. Quantitative data is the data which is being expressed in certain quantity, amount or range. There are measurement units associated with the data for example metres, inches etc. It makes sense to set limits to such data and it is also meaningful to apply arithmetic operations to the data. Qualitative data is the descriptive and conceptual findings collected through qualitative research tools like observations , interviews etc. Analyzing qualitative data allows us to explore ideas and further explain quantitative results.

There are different types of tools or instruments and techniques of data collection available for the researchers for helping the researcher in their task of data collection. These instruments of data collection help them in extracting or obtaining data (information and evidences) from the available resources which

could be primary or secondary for their respective quantitative or qualitative research studies. Each of these research instruments has its distinction to help in collection of certain specific types of information or evidences from different sources of information. A researcher requires thorough knowledge about availability, development and use of different varieties of data collection instruments. When researcher collect information or evidences, those pieces of information may be available to him in both quantitative or qualitative forms. One can have the best research design in the world but if you cannot collect the required data, you will not be able to complete your project. Data Collection is very demanding, challenging and ethical job which needs thorough planning, hard work, dedication, patience, preserverance and research ethics to complete it successfully. Data collection starts with determining what kind of data required followed by selection of sample from a certain population. After that, you need to use certain data collection instruments to collect the data from the selected sample.

Types of Data:

Data are organized into two broad categories: Quantitative and Qualitative.
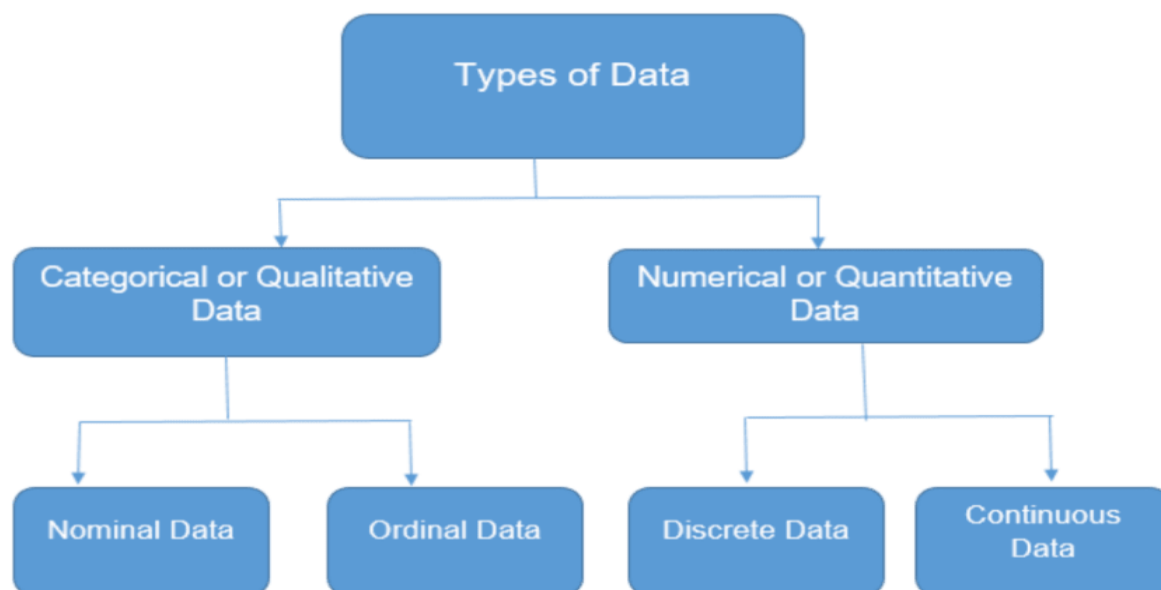
1. Quantitative Data: Quantitative Data is numerical in nature and can be mathematically computed. Quantitative data measure uses different scales like rating scales and attitude scale etc, which can be classified as nominal scale, ordinal scale, interval scale and ratio scale. Quantitative approaches address the ' what' of the program. They use a systematic standardized approach and employ methods such as surveys and ask questions. Quantitative approaches have the advantage that they are cheaper to implement, are standardized so comparisons can be easily made and the size of the effect can usually be measured.

Some of the data collection instruments in quantitative research are:

Quantitative Observation: Quantitative observation implies an objective collection of data for analysis based on their numerical and statistical attributes. The primary focus is on numbers and values. It involves performing research to find information about entire population. It deals in quantifiable variables. It provides measurable data like area , weight , height etc. It is utilized for collecting 'live' data with the help of one's senses of observation (watching and listening) in the controlled or naturalistic setting of the occurrence of events.

According to **Young** , " Observation is a systematic and deliberate study through the eyes of spontaneous occurrences at the time they occur. The purpose of the observation is to perceive the nature and extent of significant interrelated elements within complex social phenomenon, cultural patterns or human conduct."

Kinds of Observation:

➢   Participant and non-Participant Observation
➢   Structured and Non-Structured Observation
➢   Uncontrolled and Controlled Observation
➢   Individual and Group Observation

Questionnaire: Questionnaire is the data collection tool which is in the shape of a form containing a set of appropriate questions meant for collecting necessary data from the subjects of the study by getting it filled in by the subjects themselves.

According to **Best and Kahn** , " A questionnaire represents the general category inquiry form including data gathering instrument through which respondents answer questions or responds to statements in writing. A questionnaire is used when factual information is desired. When opinion rather than facts are desired, an opinionnaire or attitude scale is used. Of course, these two purposes can be obtained into one form that is usually referred to as a questionnaire."

Kinds of Questionnaires:

➢   Close –ended and open-ended Questionnaires
➢   Structured and Non-Structures Questionnaires
➢   Self –Administered and interviewed Questionnaire
➢   Oral and written Questionnaires

Interviews: An Interview is a data collection tool which is used for collecting data from the participants directly through a verbal interaction by making them respond to the purposefully framed questions aimed at serving the objectives of the study.

According to **Cannell and Kahn** , " A research interview is a two-person conversation initiated by the interviewer for the specific purpose of obtaining research relevant information and focused by him on content by research objectives of systematic description, prediction or explanation.

Kinds of Interview:

➢ Individual and group Interviews

➢ Face-to-face and Telephonic Interviews

➢ Directed and Non-Directed Interviews

➢ Structured and Non-Structured Interviews

➢ Formal and Informal Interviews

2. Qualitative Data:

Qualitative data is mostly non-numerical and usually descriptive or nominal in nature. Qualitative approaches aims to address the 'How' and 'Why' of the research problem and tend to use unstructured methods of data collection to fully explore the topic. Qualitative questions are open-ended. Such methods include focus groups, group discussion and interviews. They are good for further exploring the effects and unintended consequences of a program. They are quite expensive and time consuming and can also include baisness. Additionally the results cannot be generalized to participants outside of the program and are only indicative of the group involved.

Qualitative data collection methods play an important role in impact evaluation by providing information useful to understand the processes behind observed results. These methods can be used to improve the quality of survey-based quantitative evaluations by helping generating evaluation hypothesis and strengthening the design of survey questionnaires and expanding or clarifying quantitative evaluation findings.

Some of the qualitative data collection instruments are:

Qualitative Observation: Qualitative observation is a research method in which researcher collect data using their five senses which are sight, smell, touch, taste and hearing. It is subjective method of gathering information as it depends on researcher's sensory organs.

Focus Groups: A Focus group is a form of qualitative research in which a group of people are asked about their perceptions, opinions, beliefs and attitudes towards a product , service, concept, advertisement, idea or packaging. It is a research method that brings together a small group of people to answer questions in a moderated setting.

In-depth Interviews: It is a type of interview which deals with individual that aims to collect detailed information beyond initial and surface-level answers. It takes quite a long time to conduct such interviews.

Conclusion: There are different kinds of research tools or instruments available for different kinds of research but it is very important to become aware about research tools and its application. Many of the possible obstacles when it comes to gathering data can be avoided by running a pilot with the data collection tools you intend to use with a small number of informants before you start the actual data

collection process. This can help to quickly identify any unforeseen problems and allowing changing any question or task that are unproductive.

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<u>REPORT</u>

<u>Day-1:-</u>

Biyani Girls B.Ed College organised ICSSR sponsored national seminar titled "Methods of Measuring and Interpretation of Outcomes in Educational and Social Research" on 14 and 15 April 2022. Opening remark was given by prof. Manish biyani. Chief Guest was prof. P.C. Trivedi, former VC (JNVU), Jodhpur. The Chairmen sir dr. Rajeev Biyani sir did the flower welcome of the chief guest. After that Dr. Ekta Pareek, principal of Biyani Girls B. Ed. College did the warm welcome with flowers of chairman sir and director sir. After This great welcome the welcome remark has given by Dr. Manish Biyani (Professor JAIST University).

After this Prof. P. C. Trivedi given his speech and said that the research is only a way to do reform in education. A teacher is never an ordinary person, he have the stamina to change personality. Teacher should develop the habit the regular reading, meditation, thinking and using new ideas in education. He state about the degradation of character in human being and also described the role of teacher in building and creating a good and effective personaility through his efforts. He also include the factors to make education qualitywise effective through laboratory, library and leadership. To develop the education as the strength of our Indian economy there is only wqay is research. After speech Dr. Rajiv Biyani gave a momento in respect.

After that technical session – I has started, Dr. Harjeet Kaur Bhatiya, (Professor, Education Department, Jamia Millia Islamia Central University, Delhi) started the session and told about research ethics, research tool. He also told about the role of research committee, rightfull authorship,and to make norms for data interpretation.

Then the refreshment has organized for all the guests and participants.

In second technical session the scientific management tyles of referencing described by Dr. Devika Agarwal (HOD Com. And Management, Biyani Group of College, Jaipur) she also disscuss the APA, MLA styles of bibliography writing.

The third technical session has headed by Dr. Deepak Gupta (data analyst and satisfaction, C.E.O., CDART Pvt. Ltd) sir, he express his views on "Introduction of Different Types of Data Collection Instruments". He also told about data collection strategies.

After all the sessions oral presentation has given by the presenters. At the end of the day Vote of Thanks Given By Dr. Ekta Pareek, Principal, BGBC.

Day-2:-

On the second day of National Seminar at Biyani Girls B.Ed. College, Jaipur first the worship of Godess Saraswati has done. In the technical session 4th Dr. Deepak Gupta (data analyst and satisfaction, C.E.O., CDART Pvt. Ltd) sir, has described the views on "interpretation of different parametric and non-parametric statistics and their importance in research". He also present his views on Statistical Test: An Overview as research paper presentation.

In technical session 5th on the topic "the measurements errors in education research" Dr. Sampark Acharya (Asst. Professor Rajasthan Shikshak Mahavidhyalaya, Jaipur) has expressed his views on it and he also told about sample errors.

After it technical session 6th was started by Prof. Anjali Sharma (Head of Education Central University, Kishangarh, Rajasthan) on the topic "process of construction of standardize tool: validity, reliability, objectivity, item analysis". She told the importance of these research techniques to make any research effective and approachable.

After these technical sessions the oral presentation has done by research scholers. At the end of the day certificates also distributed to participants.

The vote of thanks and closing session has done by Dr. Ekta Pareek, Principal, BGBC.

OUTCOMES OF THE SEMINAR

In the two days ICSSR sponsored National Seminar follwing outcomes came out:-

❖ This seminar helped to understand the methods of measuring and interpretation of data. The participents learned the various ways of using research methodology and data collection tools through the different examples and field experts.

❖ This seminar was useful to understand the different types of tool to collect data in research such as questionnaire, interview, survey, observation, case study method and check list etc.

❖ This seminar provided a platform to understand the value of tools, their place in research and way to prepare their interpretation and results. It also give a sightful way to present the data in a productive manner to the research scholars to make their research as a milestone in their research field.

❖ The seminar also provided information about to understand the construction of standardize and non-standardize tool and also get the knowledge about the utility of different types of tools to make the research successful and easy to understand by the different experts of the research field.

❖ The seminar also provided information about the challenges faced during the training of prepairing standardize tool and effectiveness of standardize tool. This information provide the right path and direction to the research by avoiding the obstacles during research.

❖ This seminar was helpful to understand the process of construction of standardize tools and also understand the importance and process of validity, reliability, objective and item analysis. This also emphasise the problem of researcher regarding fake data representation so he/she can escape from false research through the use of correct data collection and interpretation.

❖ Through this seminar the knowledge about various types of data collection instruments, statistics, research and tools of research was received by the participants. This knowledge helps to researcher in selecting and appropriate using of data collection tools, statistics and data interpretation techniques for making the research process smoothly.

❖ It was discovered through the seminar that a right approach towards research and data collection instrument can make a research effective and usefull.

❖ The important aspect was known through the seminar that the scientific management styles of referencing can make the research applicable and effective. It also gave the guidance to make a research sustainable and revolutionary through scientific approach.

❖ Through this seminar some negative effects also known as:-measurement errors in education research, lake knowledge of standardize tools, errors of applying tools, misconception about reliability, vailidity etc. and also get the solution through the scientific approach of research by the field experts as how to select a data collection tool, methods of referencing, data interpretation etc.