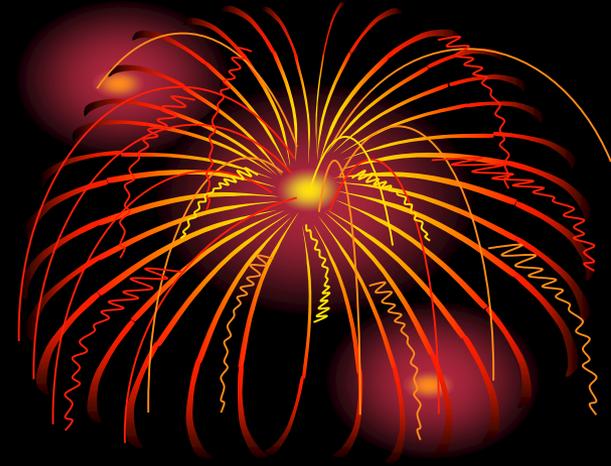


**Preparation of Research Projects and  
Scientific Writing in Agricultural  
Extension (AEE-407) 3(2-1)**

**Instructor: Dr. Ejaz Ashraf,  
Assistant Professor, UCA-UOS**

# Communication



Email: [ejazashraf60@hotmail.com](mailto:ejazashraf60@hotmail.com)

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12.20 Noon

# Resources used



- **As a human being our knowledge is limited, however; Allah (SWT) knows everything.  
Therefore**
- **Online Resources**
- **Research journal articles**
- **Research methodology books will be used for the preparation of this lecture series for the course “407- Preparation of Research project and report writing”**

# Course Outcomes



- **The purpose of this course is to prepare students to be producers and informed consumers of research methodology. After completing the course you will be able to:**

# Course Outcomes (Cont'd.)



- **Define a problem to be researched**
- **Conduct a critical review of the literature related to a research topic**
- **Formulate research hypotheses, objectives, and /or questions from theory, logic and related research**
- **Classify a given set of variables**
- **Determine an appropriate sample size**

# Course Outcomes (Cont'd.)

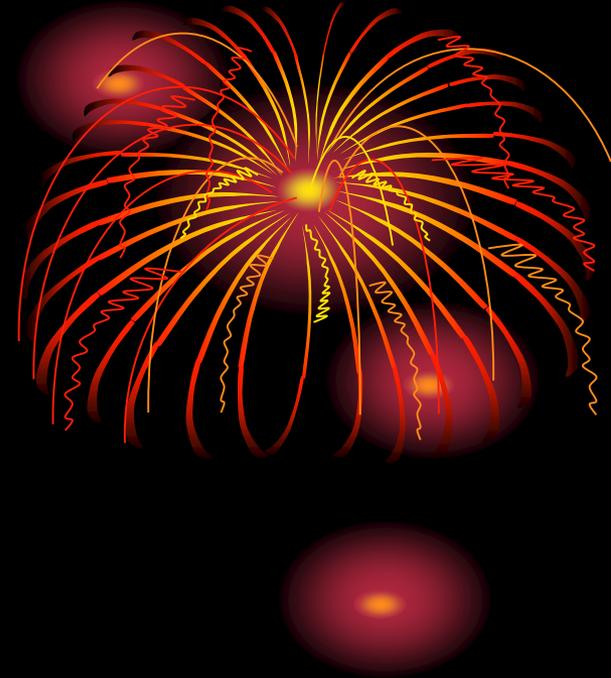


- **Classify types of research**
- **Evaluate a research design for given situation**
- **Identify the layout plan for the design in the field**
- **Distinguish between research and null hypotheses**
- **Select the appropriate statistical analysis for a given situation**

# Course Outcomes (Cont'd.)



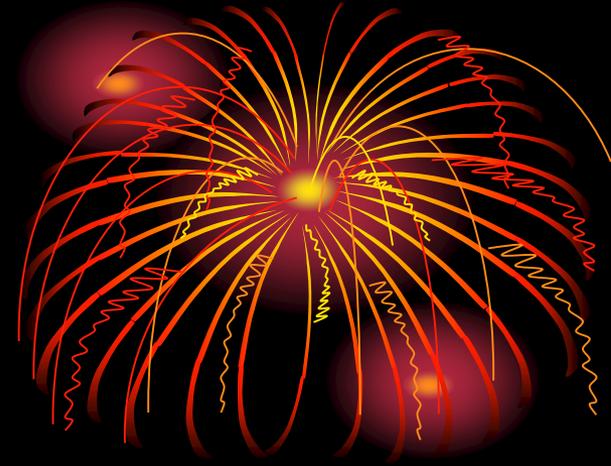
- **Determine the threats to the research designs**
- **Conduct pilot/trial studies**
- **Critique examples of previously conducted research**
- **Determine research ethics and honesty**
- **Write appropriate technical report**



# Text Book to used

- **Ary, D., Jacobs, L.C., & Razavieh, A.**  
**Introduction to Research in Education**  
**5th Edition, Forth Worth TX**

# Ready to do Research?



- **Develop first three chapters of the research proposal**
- **Conduct a thorough review of the literature**

# Contents of Theses & Dissertations



- **Cover Page**
- **Table of contents**
- **Other Preliminary pages**

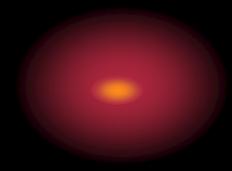
# Chapter -1 Introduction



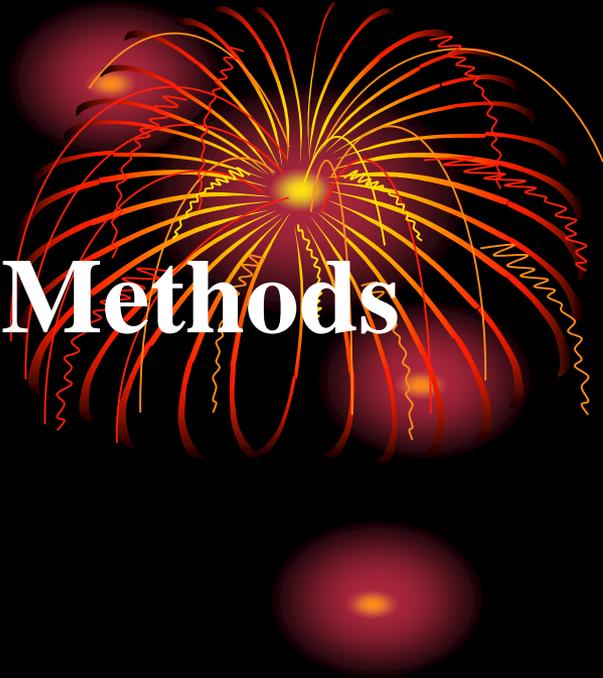
- **Background & Setting**
- **Statement of the problem**
- **Research Objectives/Research Hypotheses**
- **Definition of Terms**
- **Assumptions**
- **Limitations**
- **References**

# Chapter-2 Review of Literature



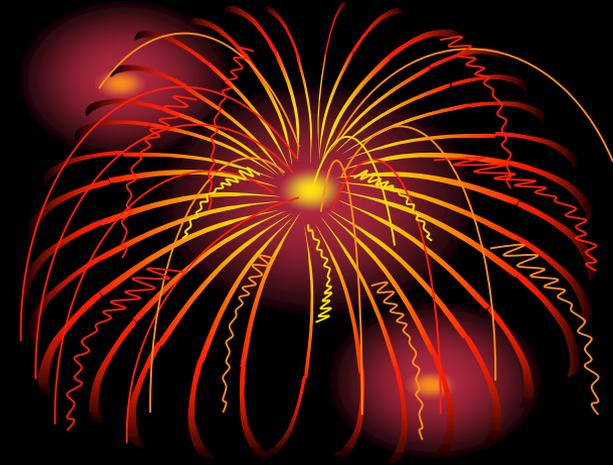
- **Split your sections based on your research objectives**
  - **Review each section as per objectives**
  - **Summary at the end which leads to the research objectives and research hypotheses**
  - **References**
- 

# Chapter-3 Materials and Methods



- **Sampling**
- **Research Design**
- **Layout**
- **Experimental units and Treatments**
- **Data Analyses techniques**
- **Field study (trial or pilot study)**
- **Preparations for full length study**

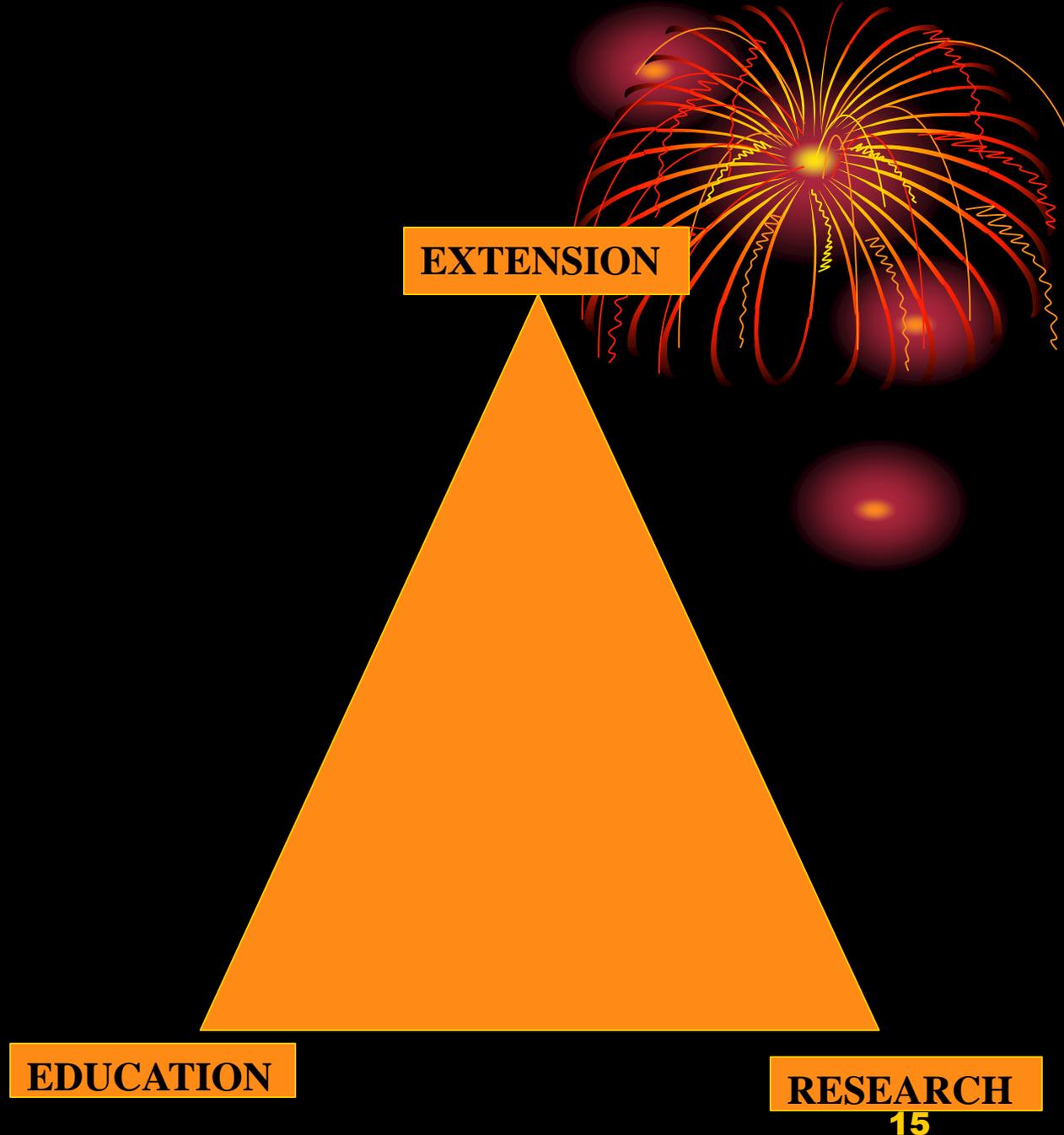
# Education & Research



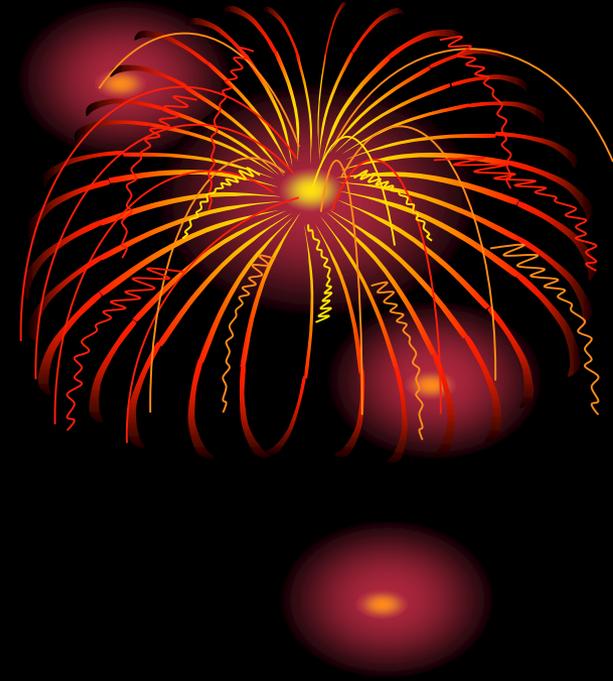
- **Relationship between the two**
- **Must prepare the HR to create/innovate something extra-ordinary**
- **No creation/innovation= 0 Development**
- **Point to think where are we heading?**

# Golden Triangle

- **Academics**
- **Research**
- **Extension**



# Quote of the Day



**Science goes with the method and  
not by subject matter**

**By karl Pearson**

# What is Research



- **Research is based on hypotheses**
- **Research tests the hypothesis and evolves a theory**
- **Research is abstract, only researcher give it any physical shape**
- **Thirst for knowledge is the biggest incentive**

# Pure and Applied Science Research



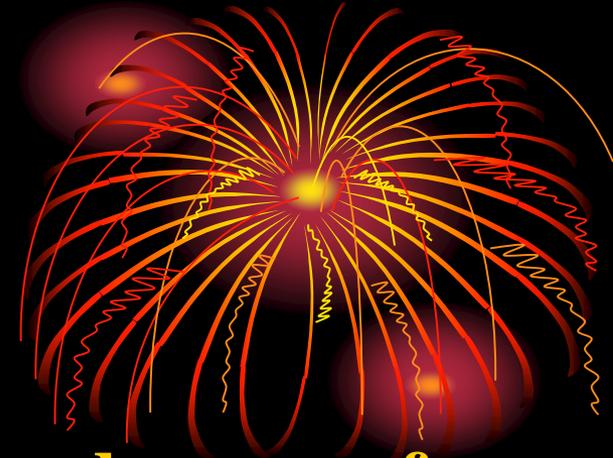
- **Measurements are mostly objective**
- **They measure physical dimensions and parameters**
- **Quantitative in nature**
- **Easy to get paired samples**
- **Standardization is achievable**
- **Homogeneity in sample is important**
- **The results can be replicated**

# Aims of Science



- ***Understanding:*** It means why, when, and how did the phenomena occur and to understand the conditions of the occurrence
  - Study the pattern of occurrence
- ***Explanation:*** Theory explains phenomena. It does so by understanding the relationships among the variables

# Aims of Science



- ***Prediction:*** One criterion of the adequacy of theory is its capability of prediction.
  - In addition, perfection of explanation is also measured by the validity and accuracy of prediction
- ***Control:*** It is a process by which an order exists within a system and modifies, regulates or directs the behavior of another order in the same system

# Purpose of Research



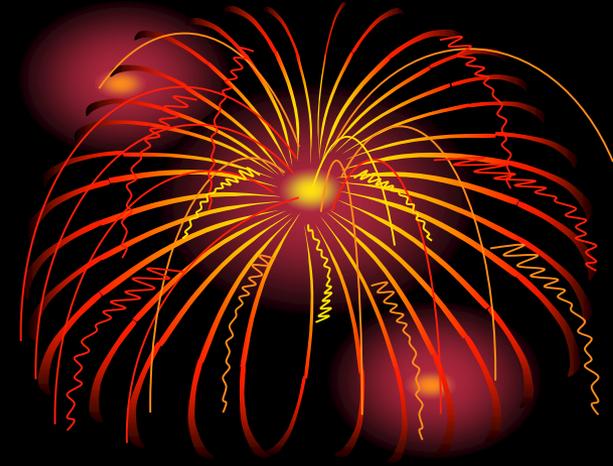
- **The purpose of research is to either create or test a theory**
- **By research, we can prove merits and demerits of theory**
- **Research provides a data to validate any theory**

# Defining Research



- 1. Research is a systematic, formal rigorous and precise process employed to gain solutions to problems and/or to discover and interpret new facts and relationships. (Waltz and Bausell, 1981, p.1).**

# Defining Research



**2. Research is the process of looking for specific answers to specific questions in an organized and reliable way (Payton, 1979, p.4).**

# Defining Research



- 3. Research is systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomena (Kerlinger, 1973, p.1).**

# Two Main Divisions of Research



- 1. Quantitative Research**
- 2. Qualitative Research**

# Quantitative Research



- **Deals with numbers, graphs, lines, mathematical models, and numerically expressed quantities**
- **Develops theories and tests hypotheses which deal with factual data**
- **Establishes relationships among different phenomena**

# Cont'd



- **Widely used in Biology, Physics, natural and social sciences, also in life sciences**
- **An iterative process, in which evidence is evaluated, theories and hypotheses are refined, technical advances are made and many more**

# Meaning of a Word from Merriam-Webster, Online



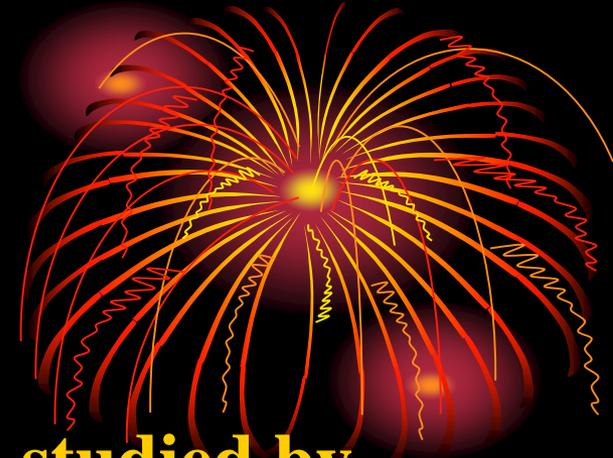
- **The word of the day “iterative”, 15th century word**
- **Means: Repetition of an action may be verbal, relating to an operation or procedure.**

# Statistics in Quantitative Research



- **Widely used branch of mathematics in quantitative research**
- **Statistical process begins with the collection of data based on theory or hypothesis**
- **Followed by the applications of descriptive and or inferential statistical methods**
- **Large amount of data is collected, which require validating, verifying, and recording before analysis**
- **Used different statistical computer soft-wares such as SAS, R, and SPSS**

# Cont'd



- **Cause and effect relationships are studied by manipulating factors which thought to influence the phenomena of interest while controlling other variables relevant to the experimental outcomes.**
- **Example: Researchers might measure and study the relationship between dietary intake and measurable physiological effects such as weight loss, controlling for other key variables such as exercise.**

# Measurement in Quantitative Research



- **Role of measurement in quantitative research is somewhat divergent**
- **Measurement is not merely mean a quantity by which observations express numerically**
- **Measurement often plays more important role in quantitative research**

# Cont'd



- For example, Thomas Kuhn (1961) argued that results which appear anomalous in the context of accepted theory potentially lead to the genesis of a search for a new, natural phenomenon. He believed that such anomalies are most striking when encountered during the process of obtaining measurements.

# Examples of Quantitative Research



- **Research that consists of the percentage amounts of all the elements that make up Earth's atmosphere**
- **Survey that concludes that the average patient has to wait two hours in the waiting room of a certain doctor before being selected.**
- **An experiment in which group x was given two tablets of Aspirin a day and Group y was given two tablets of a placebo a day where each participant is randomly assigned to one or other of the groups.**
- **The numerical factors such as two tablets, percent of elements and the time of waiting make the situations and results quantitative.**

# Another Quote



- **Couse jee “Columnist-Dawn” said, according to Jinnah Sb. Every proceeding government is worse than the previous one.**
- **He said “ I am waiting that someone will come and prove it wrong”**
- **What do you think?**

# Qualitative Research



- **Mostly used in social science**
- **Non-probability sampling (not randomly assigned)**
- **Researcher's role is vital**
- **Data analysis differs from quantitative research significantly**
- **Data coding needs extra care**

# Qualitative Research, Cont'd



- **Researcher aim is to gather in-depth understanding of human behavior**
- **It investigates the *why* and *how* of decision making, not just *what*, *where*, and *when*.**

# Data Collection methods



- 1. Participation in the setting**
- 2. Direct Observation**
- 3. In-depth Interviews**
- 4. Analysis of documents and materials**
- 5. Use of focus groups and key informants interviews**

# Qualitative Vs Quantitative Research



- **Qualitative research is exploratory in nature i.e. hypothesis generating**
- **Qualitative research is useful in policy and evaluation studies**
- **Quantitative research aim is to test hypothesis**
- **Quantitative research involves analysis which leads to the use of mathematics**
- **Qualitative data cannot always put into graphs or in mathematics**



# Questions

